

This document gives pertinent information concerning the reissuance of the VPDES Permit listed below. This permit is being processed as a Major, Municipal permit. The discharge results from the operation of a 2.5 MGD wastewater treatment plant. This permit action consists of updating the proposed effluent limits to reflect the Virginia Water Quality Standard (WQS) (9VAC25-260-00 *et seq.*)(Effective: January 6, 2011) and updating permit language, as appropriate, to reflect current boilerplate. The effluent limitations and special conditions contained in this permit will maintain the WQS.

1. Facility Name and Mailing Address: Town of Warrenton Wastewater Treatment Plant
P. O. Drawer 341
Warrenton, VA 20188-0341
SIC Code : 4952 WWTP
Facility Location: 731 Frost Avenue
Warrenton, VA 20188
County: Fauquier
Facility Contact Name: Allen G. Chichester
Telephone Number: 540-347-1104
2. Permit No.: VA0021172
Expiration Date of previous permit: February 15, 2010
Other VPDES Permits associated with this facility: VAN020028
Other Permits associated with this facility: Air Reg. #40883
Petroleum ID 3025198
E2/E3/E4 Status: N/A
3. Owner Name: Town of Warrenton
Owner Contact/Title: Edward B. Tucker, Utilities Director
Telephone Number: 540-347-1858
4. Application Complete Date: October 14, 2009
Permit Drafted By: Joan C. Crowther
Date Drafted: December 8, 2010
Draft Permit Reviewed By: Alison Thompson
Date Reviewed: December 9, 2010
Draft Permit Reviewed By: Bryant Thomas
Date Reviewed: December 20, 2010
Public Comment Period : Start Date: March 18, 2011
End Date: April 18, 2011
5. Receiving Waters Information: See Attachment 1 for the Flow Frequency Determination
Receiving Stream Name : Great Run, UT
Drainage Area at Outfall: 1.24 sq.mi.
River Mile: 3-XHS00.22
Stream Basin: Rappahannock River
Subbasin: None
Section: 4
Stream Class: III
Special Standards: None
Waterbody ID: VAN-E02/RA07
7Q10 Low Flow: 0.013 MGD
7Q10 High Flow: 0.125 MGD
1Q10 Low Flow: 0.011 MGD
1Q10 High Flow: 0.101 MGD
Harmonic Mean Flow: 0.199 MGD
30Q5 Flow: 0.041 MGD
303(d) Listed: No
30Q10 Flow: 0.025 MGD
TMDL Approved: Yes
Date TMDL Approved: EPA approved 1/23/08
SWCB approved 7/21/08
6. Statutory or Regulatory Basis for Special Conditions and Effluent Limitations:

<input checked="" type="checkbox"/> State Water Control Law	<input checked="" type="checkbox"/> EPA Guidelines
<input checked="" type="checkbox"/> Clean Water Act	<input checked="" type="checkbox"/> Water Quality Standards
<input checked="" type="checkbox"/> VPDES Permit Regulation	<input type="checkbox"/> Other
<input checked="" type="checkbox"/> EPA NPDES Regulation	

7. Licensed Operator Requirements: Class I
8. Reliability Class: Class I
9. Permit Characterization:

<input type="checkbox"/> Private	<input checked="" type="checkbox"/> Effluent Limited	<input type="checkbox"/> Possible Interstate Effect
<input type="checkbox"/> Federal	<input checked="" type="checkbox"/> Water Quality Limited	<input type="checkbox"/> Compliance Schedule Required
<input type="checkbox"/> State	<input checked="" type="checkbox"/> Toxics Monitoring Program Required	<input type="checkbox"/> Interim Limits in Permit
<input checked="" type="checkbox"/> POTW	<input type="checkbox"/> Pretreatment Program Required	<input type="checkbox"/> Interim Limits in Other Document
<input checked="" type="checkbox"/> TMDL		

10. Wastewater Sources and Treatment Description:

The Town of Warrenton Wastewater Treatment Plant consists of preliminary, primary, secondary and tertiary treatment stages. The influent wastewater undergoes physical treatment in the first two stages including screening, grit removal, and primary sludge removal. The secondary stage includes the existing trickling filters and rotating biological contactors (RBC) providing for biological BOD removal and nitrification. In the nitrification process, the ammonia-nitrogen and most of the organic nitrogen in the wastewater is oxidized to nitrate-nitrogen. The suspended solids from the RBC process settle in the secondary clarifiers, aided by chemical addition. Phosphorus removal is controlled through chemical addition and precipitation in the secondary clarifiers. Nitrified effluent from the secondary clarifier enters the tertiary treatment stage which was added as part of the "Nutrient Removal Upgrade" in 2009. This stage provides final nitrogen removal through a biological denitrification process consisting of deep-bed denitrifying filters with coarse sand media also providing partial removal of remaining suspended solids prior to effluent disinfection (UV) and plant discharge.

A Certificate to Operate dated June 18, 2008 was issued for the operation of the ultraviolet disinfection system. On November 13, 2009 a Certificate to Operate was issued for the deep bed denitrification filters, ethanol and phosphoric acid feed systems, sodium hypochlorite feed system for non-potable water, filter influent pump station, backwash water system, pumps, clearwell, mudwell, instrument air system, filter control system and related appurtenances.

See Attachment 2 for a facility schematic/diagram.

TABLE 1 – Outfall Description

Outfall Number	Discharge Sources	Treatment	Design Flow	Outfall Latitude and Longitude
001	Domestic and Commercial Wastewater	See Item 10 above.	2.5 MGD	38° 43' 00" N 77° 48' 57" W
See Section 12 for the Warrenton USGS Topographic map (DEQ #196A).				

11. Sludge Treatment and Disposal Methods:

The primary and secondary sludges are blended in a gravity thickener. Sludge is then pumped to a primary anaerobic digester with the temperature maintained at 95°F. The sludge is then transferred to a secondary digester where it is held for solids dewatering on a 2 meter belt press. The cake sludge is then held on site in covered sludge drying beds which have drainage back to the head of the plant. Recyc Systems, Incorporated is called for final disposal when two drying beds are at capacity. Recyc land applies the sludge under VPA Permit No. VPA00004.

12. Discharges, Intakes, Monitoring Stations, Other Items in Vicinity of Discharge:

This Warrenton USGS Topographic Map locates the Town of Warrenton Wastewater Treatment Plant's discharge point along with the four DEQ ambient water quality monitoring stations located within a 2 and 5 mile radius of the discharge point. The 3-GRT007.22 ambient water quality monitoring station is located on Great Run and is upstream from its confluences of the WWTP's receiving stream unnamed tributary to Great Run. Ambient water quality monitoring stations 1aCER032.15 and 1aCER030.62 are located on Cedar Run in the Potomac River Basin and 3-CAE006.32 is located on Carter Run in the Rappahannock River Basin. The 3-GRT001.70 ambient water quality monitoring station located on Great Run is not sited on the map because it is beyond the 5 mile radius of the facility's discharge point.

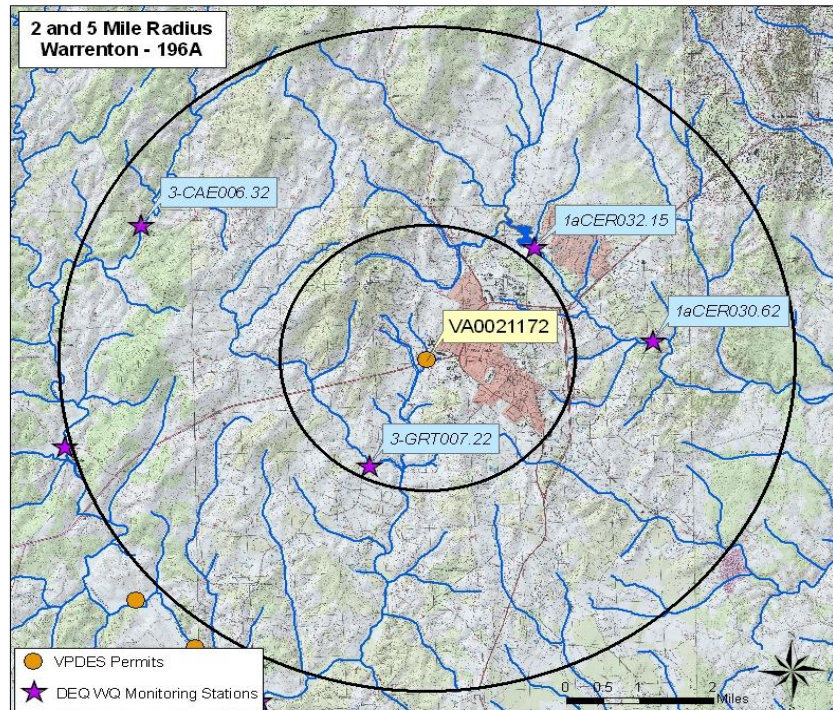
**13. Material Storage:**

TABLE 2 - Material Storage		
Materials Description	Volume Stored	Spill/Stormwater Prevention Measures
Soda Ash	1800 lbs.	Digester Building
Praestol 2540 anionic polymer	325 lbs.	Chemical Building
Praestol 857 cationic polymer	900 lbs.	On landing leading to the Belt Press Room
Delpac	2500-5000 gallons	In two separate 6000 gallon tanks between the headworks and chemical building
Methanol	6400 gallons	In a 11800 gallon tank next to the old sulfur dioxide bid
Diesel Fuel	1900 gallons	In three separate tanks, all at the headworks area
Caustic Soda (50%)	55 gallons	Chemical Building
Sodium Hypochlorite (12.5%)	20 gallons	In room in older plant pump station
Phosphoric Acid (10%)	20 gallons	In old sulfur dioxide building

14. **Site Inspection:** Performed by Sharon Allen on April 23, 2008 (see Attachment 3).

15. **Receiving Stream Water Quality and Water Quality Standards:**

a) Ambient Water Quality Data

There is no monitoring data for the unnamed tributary to Great Run. The nearest downstream DEQ water quality monitoring station with ambient data is Station 3-GRT001.70, located on Great Run at the Rt. 687 bridge crossing, approximately 7.0 miles downstream from the outfall. This monitoring station is located on segment VAN-E02R_GRT01A00, which begins at the confluence with an unnamed tributary to Great Run, approximately 1.0 rivermiles upstream of Route 687, and continues downstream until the confluence with the Rappahannock River.

The following is the monitoring summary for Station 3-GRT001.70, as taken from the 2008 Integrated Assessment for the DEQ ambient and fish tissue/sediment monitoring station 3-GRT001.70, at Route 687.

E.coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. A bacteria TMDL for the Great Run watershed has been completed and approved.

The aquatic life use is considered fully supporting with an observed effect, as the consensus based probable effects concentration (PEC) sediment screening values for nickel (48.6 ppm, dry weight) was exceeded in a sediment sample collected in 2006.

The wildlife and fish consumption uses are considered fully supporting.

The Planning Statement dated December 27, 2010, is Attachment 4 for additional information.

Significant portions of the Chesapeake Bay and its tributaries are listed as impaired on Virginia's 303(d) list of impaired waters for not meeting the aquatic life use support goal, and the 2008 Virginia Water Quality Assessment 305(b)/303(d) Integrated Report indicates that much of the mainstem Bay does not fully support this use support goal under Virginia's Water Quality Assessment guidelines. Nutrient enrichment is cited as one of the primary causes of impairment.

In response, the Virginia General Assembly amended the State Water Control Law in 2005 to include the *Chesapeake Bay Watershed Nutrient Credit Exchange Program*. This statute set forth total nitrogen and total phosphorus discharge restrictions within the bay watershed. Concurrently, the State Water Control Board adopted new water quality criteria for the Chesapeake Bay and its tidal tributaries. These actions necessitate the evaluation and the inclusion of nitrogen and phosphorus limits on discharges within the bay watershed.

b) Receiving Stream Water Quality Criteria

Part IX of 9VAC25-260(360-550) designates classes and special standards applicable to defined Virginia river basins and sections. The receiving stream, Great Run, UT, is located within Section 4 of the Rappahannock River Basin, and classified as Class III water.

At all times, Class III waters must achieve a dissolved oxygen (D.O.) of 4.0 mg/L or greater, a daily average D.O. of 5.0 mg/L or greater, a temperature that does not exceed 32°C, and maintain a pH of 6.0-9.0 standard units (S.U.).

Freshwater – Water Quality Criteria/Wasteload Allocation Analysis (Attachment 5) details other water quality criteria applicable to the receiving stream. The 1999 Water Quality Criteria/Wasteload Allocation Analysis is only available for the ammonia as N parameter and is found in Attachment 5. The 2004 and 2010 Water Quality Criteria/Wasteload Allocation Analysis are found in Attachment 5.

Ammonia:

During this reissuance, staff re-evaluated the receiving stream ambient monitoring data for pH and temperature and the effluent data for pH. The stream ambient monitoring (3-GRT001.70 (January 1999 – November 2007)) (Attachment 6) was reviewed and no significant differences from the data used to establish ammonia criteria and subsequent effluent limits in the previous 2004 permit were found. The 2004 permit carried forward the stream ambient monitoring data for pH and temperature from the 1999 permit reissuance. Therefore, the previously established stream pH and temperature values will be carried forward again as part of this reissuance process. All data that is available from the past two permit reissuances and this permit reissuance are shown below.

Stream Data	1999	2004	2010
Hardness		58.5 mg/L	60 mg/L
Temp 90 th %	21.1 °C	23.0 °C	21.6 °C
Temp 90 th % (Wet)	17 °C		
pH 90 th %	7.4 SU	7.8 SU	7.6 SU
pH 10 th %	6.6 SU		6.8 SU
Effluent Data			
Hardness		91.3 mg/L	91.3 mg/L
Temp 90 th %			20 °C
pH 90 th %			7.26 SU
pH 10 th %			6.6 SU

Metals Criteria:

The Water Quality Criteria for some metals are dependent on the receiving stream's hardness (expressed as mg/L calcium carbonate). The current average hardness of the receiving stream is 60 mg/L. This stream's hardness value was determined by hardness data collected between January 1999 and May 2001 at the 3-GRT001.70 ambient water quality monitoring station (Attachment 7). The previous permit reissuance used a hardness value of 91.3 mg/L derived from the expanded final effluent monitoring supplied with the 2004 application. To be consistent with the previous permit reissuance, the 91.3 mg/L effluent hardness value was carried forward for this permit reissuance instead of using the permit guidance default value of 50 mg/L. The stream hardness value used will be 60 mg/L.

Bacteria Criteria: The Virginia Water Quality Standards (9VAC25-260-170 B.) states sewage discharges shall be disinfected to achieve the following criteria:

- 1) *E. coli* bacteria per 100 ml of water shall not exceed a monthly geometric mean of 126 n/100 mls for a minimum of four weekly samples taken during any calendar month.

c) Receiving Stream Special Standards

The State Water Control Board's Water Quality Standards, River Basin Section Tables (9VAC25-260-360, 370 and 380) designates the river basins, sections, classes, and special standards for surface waters of the Commonwealth of Virginia. The receiving stream, Great Run, UT, is located within Section 4 of the Rappahannock River Basin. This section has been designated with no special standards.

d) Threatened or Endangered Species

The Virginia DGIF Fish and Wildlife Information System Database was searched on March 15, 2010 for records to determine if there are threatened or endangered species in the vicinity of the discharge. No threatened or endangered species were identified. The database results can be found in Attachment 8.

16. Antidegradation (9VAC25-260-30):

All state surface waters are provided one of three levels of antidegradation protection. For Tier 1 or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier 2

water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier 2 waters is not allowed without an evaluation of the economic and social impacts. Tier 3 water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The receiving stream has been classified as Tier 1 for the past two permit reissuances (1999 and 2004). No data has been reviewed to indicate that this designation should be changed for this permit reissuance. Permit limits proposed have been established by determining wasteload allocations which will result in attaining and/or maintaining all water quality criteria which apply to the receiving stream, including narrative criteria. These wasteload allocations will provide for the protection and maintenance of all existing uses.

17. Effluent Screening, Wasteload Allocation, and Effluent Limitation Development:

To determine water quality-based effluent limitations for a discharge, the suitability of data must first be determined. Data is suitable for analysis if one or more representative data points is equal to or above the quantification level ("QL") and the data represent the exact pollutant being evaluated.

Next, the appropriate Water Quality Standards are determined for the pollutants in the effluent. Then, the Wasteload Allocations (WLA) are calculated. The WLA values are then compared with available effluent data to determine the need for effluent limitations. Effluent limitations are needed if the 97th percentile of the daily effluent concentration values is greater than the acute wasteload allocation or if the 97th percentile of the four-day average effluent concentration values is greater than the chronic wasteload allocation. Effluent limitations are the calculated on the most limiting WLA, the required sampling frequency, and statistical characteristics of the effluent data.

a) Effluent Screening:

Effluent data obtained from Discharge Monitoring Reports (DMR) (December 2003 through February 2010) has been reviewed and determined to be suitable for evaluation. Effluent data were reviewed, and there have been no exceedances of the established Ammonia as N limitations.

The following pollutants require a wasteload allocation analysis: Ammonia as N.

b) Mixing Zones and Wasteload Allocations (WLAs):

Wasteload allocations (WLAs) are calculated for those parameters in the effluent with the reasonable potential to cause an exceedance of water quality criteria. The basic calculation for establishing a WLA is the steady state complete mix equation:

$$WLA = \frac{C_o [Q_e + (f)(Q_s)] - [(C_s)(f)(Q_s)]}{Q_e}$$

Where:	WLA	= Wasteload allocation
	C _o	= In-stream water quality criteria
	Q _e	= Design flow
	f	= Decimal fraction of critical flow from mixing evaluation
	Q _s	= Critical receiving stream flow (1Q10 for acute aquatic life criteria; 7Q10 for chronic aquatic life criteria; 30Q10 for chronic ammonia criteria; harmonic mean for carcinogen-human health criteria; and 30Q5 for non-carcinogen human health criteria)
	C _s	= Mean background concentration of parameter in the receiving stream.

The Water Quality Standards contain two distinct mixing zone requirements. The first requirement is general in nature and requires the "use of mixing zone concepts in evaluating permit limits for acute and chronic standards in 9VAC25-260-140.B". The second requirement is specific and establishes special restrictions for regulatory mixing zones "established by the Board".

The Department of Environmental Quality uses a simplified mixing model to estimate the amount of mixing of a discharge with the receiving stream within specified acute and chronic exposure periods. The simplified model contains the following assumptions and approximations:

- The effluent enters the stream from the bank, either via a pipe, channel or ditch.
- The effluent velocity isn't significantly greater (no more than 1 - 2 ft/sec greater) than the stream velocity.
- The receiving stream is much wider than its depth (width at least ten times the depth).
- Diffusive mixing in the longitudinal direction (lengthwise) is insignificant compared with advective transport (flow).
- Complete vertical mixing occurs instantaneously at the discharge point. This is assumed since the stream depth is much smaller than the stream width.
- Lateral mixing (across the width) is a linear function of distance downstream.
- The effluent is neutrally buoyant (e.g. the effluent discharge temperature and salinity are not significantly different from the stream's ambient temperature and salinity).
- Complete mix is determined as the point downstream where the variation in concentration is 20% or less across the width and depth of the stream.
- The velocity of passing and drifting organisms is assumed equal to the stream velocity.

If it is suitably demonstrated that a reasonable potential for lethality or chronic impacts within the physical mixing area doesn't exist, then the basic complete mix equation, with 100% of the applicable stream flow, is appropriate. If the mixing analysis determines there is a potential for lethality or chronic impacts within the physical mixing area, then the proportion of stream flow that has mixed with the effluent over the allowed exposure time is used in the basic complete mix equation. As such, the wasteload allocation equation is modified to account for the decimal fraction of critical flow (f).

Staff derived wasteload allocations where parameters are reasonably expected to be present in an effluent (e.g., total residual chlorine where chlorine is used as a means of disinfection) and where effluent data indicate the pollutant is present in the discharge above quantifiable levels. With regard to the Outfall 001 discharge, ammonia as N is likely present since this is a WWTP treating sewage. As such, Attachment 9 details the mixing analysis results and Attachment 5 has the WLA derivations for this pollutant.

c) Effluent Limitations Toxic Pollutants, Outfall 001

9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Those parameters with WLAs that are near effluent concentrations are evaluated for limits.

The permittee did not provide any expanded effluent testing data as required by EPA Form 2A, Part D application form. Therefore, during this permit term, the permittee will be required to perform this additional effluent testing within six months of the permit effective date and submit this data within nine months from the permit effective date. At that time, the data will be evaluated to determine if additional parameters need to be limited in the effluent. The wastewater treatment plant was just recently upgraded to include nutrient removal; therefore, the delay in requiring the additional effluent data will reflect the current effluent treatment capability. UPDATE: Please see Item 27, Staff Comments.

The VPDES Permit Regulation at 9VAC25-31-230.D. requires that monthly and weekly average limitations be imposed for continuous discharges from POTWs and monthly average and daily maximum limitations be imposed for all other continuous non-POTW discharges.

1) Ammonia as N:

Staff evaluated the new ambient water quality data for the receiving stream (See Section 15.b Ammonia) and has concluded it is not significantly different than what was used to derive the existing ammonia limits. This table summarizes the 1999 and 2010 ammonia acute, chronic and resulting

ammonia monthly average and weekly maximum concentrations. See Attachment 10 for Ammonia calculations results.

Parameter	1999	2010
Ammonia, Acute	13.48 mg/L	28 mg/L
Ammonia, Chronic	1.91 mg/L	3.7 mg/L
Ammonia – Monthly Average Concentration	1.4 mg/L	3.9 mg/L
Ammonia – Weekly Maximum Concentration	1.7 mg/L	5.1 mg/L

Changes in the ammonia Water Quality Standards have results in the higher monthly average and weekly maximum concentrations in 2004 and 2010. However, since the Town of Warrenton Wastewater Treatment Plant has demonstrated compliance with the more stringent 1999 ammonia monthly average and weekly maximum concentrations and to prevent back-sliding, these existing ammonia limitations are proposed to continue in the reissued permit.

2) Metals/Organics:

No metals or organics data were available for review; therefore, no effluent limits are proposed. UPDATE: Please see Item 27, Staff Comments.

d) Effluent Limitations and Monitoring, Outfall 001– Conventional and Non-Conventional Pollutants

No changes to dissolved oxygen (D.O.), biochemical oxygen demand-5 day (BOD₅), total suspended solids (TSS), and pH limitations are proposed.

Dissolved Oxygen, BOD₅, and TKN limitations are based on the stream modeling conducted in June 1985 (Attachment 11) and are set to meet the water quality criteria for D.O. in the receiving stream. In 1985, the stream model was conducted to ensure that the dissolved oxygen sag did not go below 5.0 mg/L in the receiving stream. The 1985 stream model was conducted at the standard coefficient sensitivity runs for the design flow (2.5 MGD) and effluent limitations met three of the four tests. The minimum dissolved oxygen for the most stringent test was 4.7 mg/L. It was staff's opinion that these effluent limitations provided an acceptable degree of risk that the water quality standards would not be violated. Since the proposed Ammonia as N effluent limitation of 1.4 mg/L is more restrictive than the TKN limitation of 5.0 mg/L, it is staff's professional judgment that the TKN limitation is not needed in the permit. Compliance with the Ammonia as N effluent limitation of 1.4 mg/L will ensure compliance with the stream model TKN limitation of 5.0 mg/L.

It is staff's practice to equate the Total Suspended Solids limits with the BOD₅ limits. TSS limits are established to equal BOD₅ limits since the two pollutants are closely related in terms of treatment of domestic sewage.

pH limitations are set at the water quality criteria.

E. coli limitations are in accordance with the Water Quality Standards 9VAC25-260-170.

e) Effluent Annual Average Limitations and Monitoring, Outfall 001 – Nutrients

VPDES Regulation 9VAC25-31-220(D) requires effluent limitations that are protective of both the numerical and narrative water quality standards for state waters, including the Chesapeake Bay.

As discussed in Section 15, significant portions of the Chesapeake Bay and its tributaries are listed as impaired with nutrient enrichment cited as one of the primary causes. Virginia has committed to protecting and restoring the Bay and its tributaries. There are three regulations that necessitate the inclusion of nutrient limitations:

- 9VAC25-40 - *Regulation for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed* requires new or expanding discharges with design flows of ≥ 0.04 MGD to treat for TN and TP to either BNR levels (TN = 8 mg/L; TP = 1.0 mg/L) or SOA levels (TN = 3.0 mg/L and TP = 0.3 mg/L). The Town of Warrenton Wastewater Treatment Plant's TN and TP annual average concentration effluent limitations are based on a WQIF Grant Agreement (Grant Number 440-S-07-04). TN is 4.0 mg/L and TP is 0.30 mg/L.

- 9VAC25-720 – *Water Quality Management Plan Regulation* sets forth TN and TP maximum wasteload allocations for facilities designated as significant discharges, i.e., those with design flows of ≥ 0.5 MGD above the fall line and ≥ 0.1 MGD below the fall line. This regulation limits the total nitrogen and total phosphorus mass loadings from these discharges.

- 9VAC25-820 *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia* became effective January 1, 2007. This regulation specifies and controls the nitrogen and phosphorus loadings from facilities and specifies facilities that must register under the general permit. Nutrient loadings for those facilities registered under the general permit as well as compliance schedules and other permit requirements, shall be authorized, monitored, limited, and otherwise regulated under the general permit and not this individual permit. This facility has coverage under this General Permit; the permit number is VAN020028.

Monitoring for Nitrates + Nitrites, Total Kjeldahl Nitrogen, Total Nitrogen, and Total Phosphorus are included in this permit. The monitoring is needed to protect the Water Quality Standards of the Chesapeake Bay. Monitoring frequencies are set at the frequencies set forth in 9VAC25-820.

Annual average effluent limitations, as well as monthly and year to date calculations, for Total Nitrogen and Total Phosphorus are included in this individual permit.

For the 2.5 MGD flow, annual average concentration limits of 4.0 mg/L TN and 0.3 mg/L TP are needed based on 9VAC40-70.A(4). The limits are based in part on the WLA assigned to the facility in 9VAC25-720. Loading limits will be governed by the general permit mentioned above.

f) Effluent Limitations and Monitoring Summary.

The effluent limitations are presented in the following table. Limits were established for Flow, BOD₅, Total Suspended Solids, Ammonia as N, pH, Dissolved Oxygen, *E.coli*, Total Nitrogen, and Total Phosphorus.

The limit for Total Suspended Solids is based on Best Professional Judgement.

The mass loading (kg/d) for monthly and weekly averages were calculated by multiplying the concentration values (mg/l), with the flow values (in MGD) and a conversion factor of 3.785.

Sample Type and Frequency are in accordance with the recommendations in the VPDES Permit Manual, except that the frequency of monitoring BOD₅, Total Suspended Solids, and Ammonia as Nitrogen was reduced from 5D/W to 4D/W. This reduction was effective during the last permit reissuance and was carried forward for this permit reissuance. The wastewater treatment plant's effluent quality during the past permit term has shown that the operation of the plant is maintained with this reduction of monitoring.

The VPDES Permit Regulation at 9VAC25-31-30 and 40 CFR Part 133 require that the facility achieve at least 85% removal for BOD₅ and TSS (or 65% for equivalent to secondary). The limits in this permit are water-quality-based effluent limits and result in greater than 85% removal.

18. Antibacksliding:

All limits in this permit are at least as stringent as those previously established. Backsliding does not apply to this reissuance.

19. Effluent Limitations/Monitoring Requirements:

Design flow is 2.5 MGD.

Effective Dates: During the period beginning with the permit's effective date and lasting until the expiration date.

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS			
		Monthly Average		Weekly Average		Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL		NA		NA	NL	Continuous	TIRE
pH	3	NA		NA		6.0 S.U.	9.0 S.U.	1/D	Grab
BOD ₅	3,5	10 mg/L	95 kg/day	15 mg/L	140 kg/day	NA	NA	4D/W	24H-C
Total Suspended Solids (TSS)	2	10 mg/L	95 kg/day	15 mg/L	140 kg/day	NA	NA	4D/W	24H-C
TKN	6	NL mg/L		NL mg/L		NA	NA	1/W	24H-C
DO	3	NA		NA		6.5 mg/L	NA	1/D	Grab
Ammonia, as N	3,5	1.4 mg/L		1.7 mg/L		NA	NA	4D/W	24H-C
<i>E. coli</i> (Geometric Mean)	3	126 n/100mls		NA		NA	NA	1/D	Grab
Nitrate+Nitrite, as N	3, 6	NL mg/L		NA		NA	NA	1/W	24H-C
Total Nitrogen ^a	3, 6	NL mg/L		NA		NA	NA	1/W	Calculated
Total Nitrogen – Year to Date ^b	3, 6	NL mg/L		NA		NA	NA	1/M	Calculated
Total Nitrogen - Calendar Year ^b	3, 6	4.0 mg/L		NA		NA	NA	1/YR	Calculated
Total Phosphorus	3, 6	NL mg/L		NA		NA	NA	1/W	24H-C
Total Phosphorus – Year to Date ^b	3, 6	NL mg/L		NA		NA	NA	1/M	Calculated
Total Phosphorus - Calendar Year ^b	3, 6	0.3 mg/L		NA		NA	NA	1/YR	Calculated
Chronic 3-Brood Static Renewal <i>C. dubia</i>	3	NA		NA		NA	NL	1/YR	24H-C
Chronic 7-Day Static Renewal <i>P. promelas</i>	3	NA		NA		NA	NL	1/YR	24H-C

The basis for the limitations codes are:

- | | | |
|------------------------------------|---|---------------------------------|
| 1. Federal Effluent Requirements | <i>MGD</i> = Million gallons per day. | <i>1/D</i> = Once every day. |
| 2. Best Professional Judgement | <i>NA</i> = Not applicable. | <i>1/W</i> = Once every week |
| 3. Water Quality Standards | <i>NL</i> = No limit; monitor and report. | <i>4D/W</i> = Four days a week. |
| 4. DEQ Disinfection Guidance | <i>S.U.</i> = Standard units. | <i>1/M</i> = Once every month. |
| 5. Stream Model- Attachment 11 | <i>TIRE</i> = Totalizing, indicating and recording equipment. | <i>1/YR</i> = Once per year. |
| 6. 9VAC25-40 (Nutrient Regulation) | | |

24H-C = A flow proportional composite sample collected manually or automatically, and discretely or continuously, for the entire discharge of the Monitored 24-hour period. Where discrete sampling is employed, the permittee shall collect a minimum of twenty-four (24) aliquots for compositing. Discrete sampling may be flow proportioned either by varying the time interval between each aliquot or the volume of each aliquot. Time composite samples consisting of a minimum twenty-four (24) grab samples obtained at hourly or smaller intervals may be collected where the permittee demonstrates that the discharge flow rate (gallons per minute) does not vary by $\geq 10\%$ or more during the monitored discharge.

Grab = An individual sample collected over a period of time not to exceed 15-minutes.

a. Total Nitrogen = Sum of TKN plus Nitrate+Nitrite

b. See Section 20.b. for the calculation of the Nutrient Calculations.

20. Other Permit Requirements:

- a)
- Part I.B. of the permit contains quantification levels and compliance reporting instructions.

9VAC25-31-190.L.4.c. requires an arithmetic mean for measurement averaging and 9VAC25-31-220.D. requires limits be imposed where a discharge has a reasonable potential to cause or contribute to an in-stream excursion of water quality criteria. Specific analytical methodologies for toxics are listed in this permit section as well as quantification levels (QLs) necessary to demonstrate compliance with applicable permit limitations or for use in future evaluations to determine if the pollutant has reasonable potential to cause or contribute to a violation. Required averaging methodologies are also specified.

- b) The calculations for the Nitrogen and Phosphorus parameters shall be in accordance with the calculations set forth in 9VAC25-820 *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia*. §62.1-44.19:13 of the Code of Virginia defines how annual nutrient loads are to be calculated; this is carried forward in 9VAC25-820-70. As annual concentrations (as opposed to loads) are limited in the individual permit, these reporting calculations are intended to reconcile the reporting calculations between the permit programs, as the permittee is collecting a single set of samples for the purpose of ascertaining compliance with two permits.
- c) Permit Section Part I.C., details the requirements for Toxics Management Program.
The VPDES Permit Regulation at 9VAC25-31-210 requires monitoring and 9VAC25-31-220.I, requires limitations in the permit to provide for and assure compliance with all applicable requirements of the State Water Control Law and the Clean Water Act. A TMP is imposed for municipal facilities with a design rate >1.0 MGD, with an approved pretreatment program or required to develop a pretreatment program, or those determined by the Board based on effluent variability, compliance history, IWC, and receiving stream characteristics. See Attachment 12 for Spreadsheet for determination of WET test endpoints dated 10/6/10 and Toxic Management Program Data Review Memo dated August 28, 2009.
- d) Permit Section Part I.D., details the requirements of a Pretreatment Program.
The VPDES Permit Regulation at 9VAC25-31-210 requires monitoring and 9VAC25-31-220.D. requires all discharges to protect water quality. The VPDES Permit Regulation at 9VAC25-31-730. through 900., and 40 CFR Part 403 requires POTWs with a design flow of >5 MGD and receiving from Industrial Users (IUs) pollutants which pass through or interfere with the operation of the POTW or are otherwise subject to pretreatment standards to develop a pretreatment program.

Historical Note:

The July 11, 1988 VPDES Permit No. VA0021172 was modified on August 4, 1989, to include the requirement for the Town of Warrenton to develop legal control of significant discharges. A March 30, 1987 Special Order was amended on October 31, 1990, to require the submittal of an enforceable legal authority and significant discharger survey. Another Consent Special Order dated January 16, 1992 directed the Town to expeditiously respond to the Northern Regional Office with respect to any comments and/or deficiencies found with the enforceable legal authority and/or significant user survey. The Town's Significant Discharger Survey was deemed complete on October 10, 1992 and the Pretreatment Legal Authority was approved on June 10, 1993. At that time, the Town had one industrial discharger that had been determined to be a categorical industry. This industry was Flex-Cut.

During the 2005 VPDES Permitting reissuance process, it was acknowledged that an industrial type discharge (landfill leachate) was being trucked to the facility for treatment. Since these discharges have the "reasonable potential" to affect the facility, DEQ required the permittee to proceed with development of a finalized pretreatment program. By letter dated January 18, 2006, the Town of Warrenton submittal the necessary documentation to develop a pretreatment program. The documentation noted that since December 1998 the categorical industry, Flex-Cut, was no longer an industrial contributor to the Town of Warrenton's Wastewater Treatment Plant. This submittal was not acted on by DEQ.

During this VPDES Permit Reissuance process, the Town of Warrenton decided to stop accepting the landfill leachate (Fall of 2010) and their January 18, 2011 Significant Industrial Users Survey revealed that there are no significant industrial users within their service area. Based on this information, DEQ is no longer requiring the permittee to proceed with the development of a pretreatment program. The permittee will be required to conduct a Significant Industrial Users Survey prior to the next reissuance and submit it with the permit reissuance application package.

e) Permit Section Part 1.E. details requirements of the Sewage Sludge Management Plan, Sludge Monitoring and Additional Reporting Requirements.

1. Regulations:

The VPDES Permit Regulation (9VAC25-31-10 et seq.), has incorporated technical standards for the use or disposal of sewage sludge, specifically land application and surface disposal, promulgated under 40 CFR Part 503.

The Permit Regulation (9VAC25-31-420) also establishes the standards for the use or disposal of sewage sludge. This part establishes standards that consist of general requirements, pollutant limits, management practices, and operational standards for the final use or disposal of sewage sludge generated during the treatment of domestic sewage in the treatment works.

2. Evaluations:

Sludge Classification:

The Town of Warrenton Wastewater Treatment Plant is considered as Class I sludge management facility. The permit regulation (9VAC25-31-500) defines a Class I sludge management facility as any POTW which is required to have an approved pretreatment program defined under Part VII of the VPDES Permit Regulation (9VAC25-31-730 to 900) and/or any treatment works treating domestic sewage sludge that has been classified as a Class I facility by the Board because of the potential for its sewage sludge use or disposal practice to adversely affect public health and the environment.

Sludge Pollutant Concentration:

The average pollutant concentrations from sewage sludge analyses provided as part of the Town of Warrenton Wastewater Treatment Plant application for the permit reissuance are presented in Table 3. The analysis results are from samples collected on March 17, 2009.

Table 3 – TOWN OF WARRENTON WASTEWATER TREATMENT PLANT RESULTS

Pollutant	Average Concentration (mg/kg dry weight)	Sample Type
Arsenic	1.5	Composite
Cadmium	0.6	Composite
Copper	260	Composite
Lead	10	Composite
Mercury	<1.5	Composite
Molybdenum	13	Composite
Nickel	17	Composite
Selenium	3.4	Composite
Zinc	400	Composite

All sewage sludge applied to the land must meet the ceiling concentration for pollutants, listed in Table 4. Sewage sludge applied to the land must also meet either pollutant concentration limits, cumulative pollutant loading rate limits, or annual pollutant loading rate limits, also listed in Table 4.

Cumulative pollutant loading limits or annual pollutant loading limits may be applied to sewage sludge exceeding pollutant concentration limits but meeting the ceiling concentrations, depending upon the levels of treatment achieved and the form (bulk or bag) of sludge applied. It should be noted that ceiling concentration limits are instantaneous values and pollutant concentration limits are monthly average values. Calculations of cumulative pollutant loading should be based on the monthly average values and the annual whole sludge application rate.

Table 4- SEWAGE SLUDGE POLLUTANT LIMITS

Pollutant	Ceiling Concentration Limits for All Sewage Sludge Applied to Land (mg/kg)*	Pollutant Concentration Limits for EQ and PC Sewage Sludge (mg/kg)*	Cumulative Pollutant Loading Rate Limits for CPLR Sewage Sludge (kg/hectare)	Annual Pollutant Rate Limits for APLR Sewage Sludge (kg/hectare/356 day period)**
Arsenic	75	41	41	2.0
Cadmium	85	39	39	1.9
Copper	4,300	1,500	1,500	75
Lead	840	300	300	15
Mercury	57	17	17	0.85
Molybdenum	75	---	---	---
Nickel	420	420	420	21
Selenium	100	100	100	5.0
Zinc	7,500	2,800	2,800	140
Applies to:	All sewage sludge that is land applied	Bulk sewage sludge and bagged sewage sludge	Bulk sewage sludge	Bagged sewage
From VPDES Permit Reg. Part VI	Table 1, 9 VAC 25-31-540	Table 3, 9 VAC 25-31-540	Table 2, 9 VAC 25-31-540	Table 4, 9 VAC 25-31-540

*Dry-weight basis

**Bagged sewage sludge is sold or given away in a bag or other container.

Comparing data from Table 3 with Table 4 shows that metal concentrations are significantly below the ceiling and PC concentration requirements.

3. Options for Meeting Land Application:

There are four equally safe options for meeting land application requirements. The options include the Exceptional Quality (EQ) option, the Pollutant Concentration (PC) option, the Cumulative Pollutant Loading Rate (CPLR) option, and the Annual Pollutant Loading Rate (APLR) option.

Pollutant Concentration (PC) is the type of sludge that may only be applied in bulk and is subject to general requirements and management practices; however, tracking of pollutant loadings to the land is not required. The sludge from the Town of Warrenton Wastewater Treatment Plant is considered Pollutant Concentration (PC) sewage sludge for the following reasons:

- a) The bulk sewage sludge from the Town of Warrenton Wastewater Treatment Plant meets the PC limits in Table 1 of VPDES Permit Regulation Part VI, 9 VAC 25-31-540.
- b) The VPDES Permit Regulation, Part VI, Subpart D, (9VAC25-31-690 through 720) establishes the requirements for pathogen reduction in sewage sludge. The Town of Warrenton Wastewater Treatment Plant is considered to produce a Class B sludge in accordance with the regulation (9VAC25-31-710.B.2. - Class B -Alternative 2. Alternative 2 defines Class B sludge as "Sewage sludge that is used or disposed that has been treated in a process that is equivalent to a Process to Significantly Reduce Pathogens (PSRP), as described in (9VAC25-31-710.D.).

The Town of Warrenton Wastewater Treatment Plant treats sludge using an anaerobic digestion process to reduce pathogens in accordance with the requirements of (9VAC25-31-710.D.3.).

c) The VPDES Permit Regulation, Part VI, Subpart D, (9VAC25-31-690 through 720) also establishes the requirements for Vector Attraction Reduction in sewage sludge. Based on the information supplied with the VPDES Sludge Application, the Town of Warrenton Wastewater Treatment Plant meets the requirements for Vector Attraction Reduction as defined by (9VAC25-31-720.B.1): the mass of volatile solids in the sewage sludge is reduced by a minimum of 38 percent, calculated according to the method in 9VAC25-31-490.B.8.).

4) Parameters to be Monitored:

In order to assure the sludge quality, the following parameters require monitoring: Arsenic, Cadmium, Copper, Lead, Mercury, Molybdenum, Nickel, Selenium, and Zinc.

In order to ensure that proper nutrient management and pH management practices are employed, the following parameters are required: pH, Total Kjeldahl Nitrogen, Ammonia Nitrogen, Nitrate Nitrogen, Total Phosphorus, Total Potassium, and Alkalinity (lime treated sludge should be analyzed for percent calcium carbonate equivalence). The nutrient and pH monitoring requirements apply only if the permittee land applies their own sludge. Since Town of Warrenton Wastewater Treatment Plant has contracted the land application responsibilities to Recyc Systems, Inc., Remington, Virginia, they are not required to monitor for nutrients, pH, Total Potassium and Alkalinity.

Soil monitoring in conjunction with soil productivity information is critical, especially for frequent applications, to making sound sludge application decisions from both an environmental and an agronomic standpoint. Since Town of Warrenton Wastewater Treatment Plant has contracted the land application responsibilities to Recyc Systems, Inc., Remington, Virginia, they are not required to perform soil monitoring.

5) Monitoring Frequency:

The monitoring frequency is based on the amount of sewage sludge applied in a given 365-day period. The permit application indicates that the total dry metric tons of sewage sludge generated at Town of Warrenton Wastewater Treatment Plant are 366 dry metric tons per 365-day period. In the permit manual, the monitoring frequency for facilities that produce equal to or greater than 290 metric tons but less than 1,500 metric tons per 365-day period is once per quarter (four times per year). This reissuance proposes a monitoring frequency of 1/quarter.

Town of Warrenton Wastewater Treatment Plant is required to provide the results of all monitoring performed in accordance with Part I.A., and information on management practices and appropriate certifications no later than February 19th of each year (as required by the 503 regulations) to the Northern Regional Office of the Department of Environmental Quality. Each report must document the previous calendar year's activities.

6) Sampling:

Representative sampling is an important aspect of monitoring. Because the pollutant limits pertain to the quality of the final sewage sludge applied to the land, samples must be collected after the last treatment process prior to land application. Composite samples should be required for all samplings from this facility.

7) Sludge Management Plan (SMP):

The SMP is required to be part of the VPDES permit application. The VPDES Sewage Sludge Permit Application Form and its attachments will constitute the applicant's SMP. Any proposed sewage treatment works treating domestic sewage must submit a SMP with the appropriate VPDES permit application forms at least 180 days prior to the date proposed for commencing operations. The permittee shall conduct all sewage sludge use or disposal activities in accordance with the SMP approved with the issuance of this permit. Any proposed changes in the sewage sludge use or disposal practices or procedures followed by the permittee shall be documented and submitted for Virginia Department of Environmental review and approval no less than 90 days prior to the effective date of the changes.

Upon approval, the SMP becomes an enforceable part of the permit. The permit may be modified or alternatively revoked and reissued to incorporate limitations/conditions necessitated by substantial changes in sewage sludge use or disposal practices.

Town of Warrenton Wastewater Treatment Plant has submitted the VPDES Sewage Sludge Permit Application Form and its attachments. Their SMP dated July 2002 is on file at the Northern Regional Office of the Department of Environmental Quality.

8) Reporting Requirements:

The reporting requirements are for POTWs with a design flow rate equal to or greater than 1 MGD (majors), POTWs that serve a population of 10,000 or greater, and Class I sludge management facilities. A permit special condition, which requires these generators to submit an annual report on February 19th of each year, is included. The Town of Warrenton Wastewater Treatment Plant shall use the Discharge Monitoring Report (DMR) forms as part of the annual report. A sample form (SP1 and S01) with proper DMR parameter codes and its instructions are provided. In addition to the DMR forms, the generators who land apply sewage sludge are responsible for submitting the additional information required by 9VAC25-31-590, *i.e.*, appropriate certification statements, descriptions of how pathogen and vector attraction reduction requirements are met, descriptions of how the management practices (if applicable) are being met, and descriptions of how site restrictions (if applicable) are being met.

9) Records Keeping:

This special condition outlines record retention requirements for sludge meeting Class B pathogen reduction and vector attraction reduction alternative 1-10. Table 6 presents the record keeping requirements.

Table 6: Record Keeping for PC Sludge

1	Pollutant concentrations of each pollutant in Part I.A.2. of the permit;
2	Description of how the pathogen reduction requirement in Part I.A.2.of the permit are met;
3	Description of how the vector attraction requirements in Part I.A.2.of the permit are met;
4	Description of how the management practice specified in the approved Sludge Management Plan and/or the permit are met;
5	Description of how the site restriction specified in the Sludge Management Plan and/or the permit are met;
6	Certification statement in Part I.D.3.b.2.f. of the permit.

21. **Other Special Conditions:**

- 95% Capacity Reopener. The VPDES Permit Regulation at 9VAC25-31-200.B.4. requires all POTWs and PVOTWs develop and submit a plan of action to DEQ when the monthly average influent flow to their sewage treatment plant reaches 95% or more of the design capacity authorized in the permit for each month of any three consecutive month period. This facility is a POTW.
- Indirect Dischargers. Required by VPDES Permit Regulation, 9VAC25-31-200 B.1. and B.2. for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.
- O&M Manual Requirement. Required by Code of Virginia §62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790; VPDES Permit Regulation, 9VAC25-31-190.E. Within 90 days of the effective date of this permit, the permittee shall submit for approval an Operations and Maintenance (O&M) Manual or a statement confirming the accuracy and completeness of the current O&M Manual to the Department of Environmental Quality, Northern Regional Office (DEQ-NRO). Future changes to the facility must be addressed by the submittal of a revised O&M Manual within 90 days of the changes. Non-compliance with the O&M Manual shall be deemed a violation of the permit.

- d) CTC, CTO Requirement. The Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9VAC25-790 requires that all treatment works treating wastewater obtain a Certificate to Construct prior to commencing construction and to obtain a Certificate to Operate prior to commencing operation of the treatment works.
- e) Licensed Operator Requirement. The Code of Virginia at §54.1-2300 et seq. and the VPDES Permit Regulation at 9VAC25-31-200 C, and Rules and Regulations for Waterworks and Wastewater Works Operators (18VAC160-20-10 et seq.) requires licensure of operators. This facility requires a Class I operator.
- f) Reliability Class. The Sewage Collection and Treatment Regulations at 9VAC25-790 require sewage treatment works to achieve a certain level of reliability in order to protect water quality and public health consequences in the event of component or system failure. Reliability means a measure of the ability of the treatment works to perform its designated function without failure or interruption of service. The facility is required to meet a reliability Class of I.
- g) Water Quality Criteria Reopener. The VPDES Permit Regulation at 9VAC25-31-220 D. requires establishment of effluent limitations to ensure attainment/maintenance of receiving stream water quality criteria. Should effluent monitoring indicate the need for any water quality-based limitations, this permit may be modified or alternatively revoked and reissued to incorporate appropriate limitations.
- h) Water Quality Criteria Monitoring. State Water Control Law §62.1-44.21 authorizes the Board to request information needed to determine the discharge's impact on State waters. States are required to review data on discharges to identify actual or potential toxicity problems, or the attainment of water quality goals, according to 40 CFR Part 131, Water Quality Standards, subpart 131.11. To ensure that water quality criteria are maintained, the permittee is required to analyze the facility's effluent for the substances noted in Attachment A of this VPDES permit.
- i) E3/E4. 9VAC25-40-70 B authorizes DEQ to approve an alternate compliance method to the technology-based effluent concentration limitations as required by subsection A of this section. Such alternate compliance method shall be incorporated into the permit of an Exemplary Environmental Enterprise (E3) facility or an Extraordinary Environmental Enterprise (E4) facility to allow the suspension of applicable technology-based effluent concentration limitations during the period the E3 or E4 facility has a fully implemented environmental management system that includes operation of installed nutrient removal technologies at the treatment efficiency levels for which they were designed.
- j) Nutrient Reopener. 9VAC25-40-70 A authorizes DEQ to include technology-based annual concentration limits in the permits of facilities that have installed nutrient control equipment, whether by new construction, expansion or upgrade. 9VAC25-31-390 A authorizes DEQ to modify VPDES permits to promulgate amended water quality standards.

Permit Section Part II. Part II of the permit contains standard conditions that appear in all VPDES Permits. In general, these standard conditions address the responsibilities of the permittee, reporting requirements, testing procedures and records retention.

23. Changes to the Permit from the Previously Issued Permit:

- a) Special Conditions:
 - 1) Pretreatment Program Special Condition has been revised to include the Significant Industrial User Survey to be conducted prior to the next permit reissuance and submitted with the VPDES Permit Application Package.
 - 2) The E3/E4 Special Condition was included since the permit includes an Annual Average Total Nitrogen Limit.
 - 3) The Nutrient Reopener was updated to reflect current agency guidance.

- 4) The Water Quality Criteria Monitoring Special Condition was added to require the permittee complete this additional effluent monitoring within 6 months of the permit's effective date and submit the data within 9 months of the permit's effective date.
- 5) The Water Quality Criteria Reopener was added should the effluent monitoring required by Water Quality Criteria Monitoring Special Condition determine other effluent limitations are required.
- 6) The Total Nitrogen and Total Phosphorus Schedule of Compliance was removed since the permittee has completed this work.
- 7) The Nutrient Reporting Calculations Special Condition was removed and these calculations are now part of Permit Part I.B.

b) Monitoring and Effluent Limitations:

- 1) The Total Residual Chlorine monitoring and effluent limitations were removed since the permittee has installed UV disinfection in June 2008.
- 2) Temperature monitoring was removed since it is not a required monitoring parameter in the permit manual.
- 3) Orthophosphate monitoring was removed since monitoring is done under the *General Virginia Pollutant Discharge Elimination System (VPDES) Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia*.
- 4) The cBOD₅ effluent monthly and weekly maximum concentrations and loadings were changed to BOD₅ effluent monthly and weekly maximum concentrations and loadings because the BOD₅ parameter is used to capture both the nitrogenous and carbonaceous BOD₅ when there is an Ammonia as N effluent parameter. cBOD₅ parameter is used when there is a TKN effluent limit. The BOD₅ effluent monthly average limitation has remained 10 mg/L.

24. Variances/Alternate Limits or Conditions:

- 1) The BOD₅, Total Suspended Solids, and Ammonia as Nitrogen frequency of monitoring was reduced from 5D/W to 4D/W during the last permit reissuance. This frequency of monitoring was carried forward for this permit reissuance. The wastewater treatment plant's effluent quality during the past permit term has shown that the operation of the plant is maintained with this reduction of monitoring.

25. Public Notice Information:

First Public Notice Date: March 18, 2011

Second Public Notice Date: March 25, 2011

Public Notice Information is required by 9VAC25-31-280 B. All pertinent information is on file and may be inspected, and copied by contacting the: DEQ Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193, Telephone No. (703) 583-3925, joan.crowther@deq.virginia.gov. See Attachment 13 for a copy of the public notice document.

Persons may comment in writing or by email to the DEQ on the proposed permit action, and may request a public hearing, during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for comments. Only those comments received within this period will be considered. The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state 1) the reason why a hearing is requested; 2) a brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and 3) specific references, where possible, to terms and conditions of the permit with suggested revisions. Following the comment period, the Board will make a determination regarding the proposed permit action. This determination

will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may request an electronic copy of the draft permit and fact sheet or review the draft permit and application at the DEQ Northern Regional Office by appointment.

26. 303 (d) Listed Stream Segments and Total Max. Daily Loads (TMDL):

This facility discharges directly to an unnamed tributary to Great Run. *E.coli* monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. A bacteria TMDL for the Great Run watershed (segments VAN-E02R_GRT03A02, VAN-E02R_GRT02A04, VAN-E02R_GRT01A00) was submitted to the U.S. EPA and approved March 10, 2005. The SWCB approved the TMDL on December 20, 2005. The TMDL did not specifically include the unnamed tributary to Great Run, but all upstream facilities were considered during TMDL development. The WLA for this facility is 4.35×10^{12} cfu/yr of *E. Coli* bacteria.

TMDL Reopener: This special condition is to allow the permit to reopened if necessary to bring it in compliance with any applicable TMDL that may be developed and approved for the receiving stream.

27. Additional Comments:

a) Previous Board Action(s): None.

b) Staff Comments:

- 1) Permit reissuance processing was delayed by staff workload.
- 2) Based on the fact that the permittee is not accepting landfill leachate and that their Significant Industrial Users Survey received on January 18, 2011, revealed no significant industrial users, the draft permit language was changed during the public comment period to require the next Significant Industrial Users Survey to be completed prior to the next permit reissuance and to be submitted with their VPDES Permit Application.
- 3) Part I.D. Nos. 7 and 8 referring to the Pretreatment Program of the draft permit were deleted during the public comment period because it was staff's opinion that these two items were no longer appropriate to be included in the permit.
- 4) During the Public Comment Period, the permittee completed their first scan of additional effluent sampling. The data was submitted on April 15, 2011. This data was reviewed and revealed that four metals; namely, total recoverable lead, total recoverable copper, total recoverable nickel, and total recoverable zinc were present in the effluent. After further review, no effluent limitations were needed. The additional effluent data results and statistical analysis for the four metals can be found in Attachment 15. The permittee will complete two additional effluent scans within the first 6 months of this permit reissuance and this data will be submitted within the first 9 months of this permit reissuance.

c) Public Comment:

Based on comments received by the permittee, the following items were revised in the fact sheet and/or draft permit:

- 1) The facility contact was changed from William Stoddard to Allen G. Chichester.
- 2) A typographical error was corrected in the Fact Sheet's Item 17.c (Effluent Limitations Toxic Pollutants, Outfall 001) and Item 23 a.4 so that both are consistent by requiring the additional effluent monitoring to be completed within six months of the permit's effective date and submitted within 9 months of the permit's effective date.

Town of Warrenton Wastewater Treatment Plant
Fact Sheet Attachments

Attachment	Description
1	Flow Frequency Memo dated March 18, 2010
2	Facility Diagram
3	Site Inspection Report dated April 23, 2008 by Sharon Mack, DEQ-NRO Water Inspector
4	Planning Statement for Town of Warrenton WWTP, dated December 27, 2010
5	1999 Ammonia Water Quality Criteria Calculation Freshwater Water Quality Criteria/ Wasteload Allocated Analysis Using 1999 Stream Data, . 2010 Effluent Data for Temperature and pH, and 2004 Effluent Hardness – December 6, 2010
6	pH and Temperature Stream Monitoring Data (3-GRT001.70) for January 1999-November 2007)
7	Hardness Stream Monitoring Data (3-GRT001.70) for January 1999-May 2001
8	DGIF Threatened and Endangered Species Database Search dated March 15, 2010
9	Mixing Zone Prediction for Town of Warrenton WWTP
10	Ammonia Effluent 1999 Calculation Results Ammonia Effluent 2010 Calculation Results
11	Stream Model dated June 1985
12	Spreadsheet for Determination of WET Test Endpoints or WET Limits dated 10/6/10 Toxic Management Program Data Review Memo dated 8/28/09
13	Public Notice
14	EPA Checklist dated December 6, 2010
15	Additional Effluent Monitoring Data and Statistical Analysis

MEMORANDUM

Subject: Flow Frequency Determination for Town of Warrenton Wastewater Treatment Plant (VA0021172)

To: Town of Warrenton WWTP Permit File

From: Joan C. Crowther, DEC-NRO

Date: March 18, 2010

This memorandum supercedes Paul E. Herman's Flow Frequency Determination memorandum dated December 3, 1998.

The Town of Warrenton WWTP discharges to an unnamed tributary of Great Run near Warrenton, Virginia. The stream flow is being determined by drainage comparison using the USGS flow monitoring station located on the Rappahannock River at Remington (#01664000). The statistical stream period being used is 1942 through 2003.

The high flow months are December through May. This analysis assumes there are no significant discharges, withdrawals, or springs influencing the flow of the Great Run, UT.

Year	Drainage Area (square mile)	Harmean	HF30Q10	HF7Q10	HF1Q10	30Q5	30Q10	7Q10	1Q10	1Q30
Rappahannock River at Remington (#10664000)										
2010 (CFS)	620	154	136	97	78	32	19	10	8.5	4.1
1998 (CFS)	620	159	159	109	89	32	20	11	8.7	
2010 (MGD)		99.5302	87.8968	62.6911	50.4114	20.6816	12.2797	6.463	5.49355	2.64983
1998 (MGD)		102.7617	102.7617	70.4467	57.5207	20.6816	12.926	7.1093	5.62281	0
Great Run, UT										
2010 (CFS)	1.24	0.308	0.272	0.194	0.156	0.064	0.038	0.02	0.017	0.0082
1998 (CFS)	1.24	0.318	0.318	0.218	0.178	0.064	0.04	0.022	0.0174	0
2010 (MGD)		0.1990604	0.1757936	0.1253822	0.1008228	0.0413632	0.0245594	0.012926	0.0109871	0.0052997
1998 (MGD)		0.2055234	0.2055234	0.1408934	0.1150414	0.0413632	0.025852	0.0142186	0.01124562	0

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

Office of Water Quality Assessments

629 East Main Street P.O. Box 10009 Richmond, Virginia 23219

DEC 4 1998

SUBJECT: Flow Frequency Determination
Warrenton STP - #VA0021172

TO: Doug Stockman, NRO

FROM: Paul E. Herman, P.E., WQAP

DATE: December 3, 1998

COPIES: Ron Gregory, Charles Martin, Eugene Powell, File

This memo supercedes my March 11, 1993 memo to Raymond Jay concerning the subject VPDES permit.

The Warrenton STP discharges to an unnamed tributary of the Great Run near Warrenton, Virginia. Flow frequencies are required at this site for use by the permit writer in developing the VPDES permit.

The VDEQ conducted several flow measurements on the unnamed tributary to the Great Run from 1993 to 1997. The measurements were made upstream of the Warrenton STP outfall, at Warrenton, VA. The measurements were correlated with the same day daily mean values from the continuous record gage on the Rappahannock River at Remington, VA #01664000. The measurements and daily mean values were plotted on a logarithmic graph and a best fit line was drawn through the data points. The required flow frequencies from the reference gage were plotted on the regression line and the associated flow frequencies at the measurement site/discharge point were determined from the graph. The data for the reference gage and the measurement site/discharge point are presented below:

Rappahannock River at Remington, VA (#01664000):

Drainage Area = 620 mi²

1Q10 = 8.7 cfs

High Flow 1Q10 = 89 cfs

7Q10 = 11 cfs

High Flow 7Q10 = 109 cfs

30Q5 = 32 cfs

HM = 159 cfs

LF 30Q10 = 20 cfs - 12.9 MGD

HF 30Q10 = 159 cfs = 103 MGD

UT to Great Run above Warrenton STP, at Warrenton, VA (#01662050):

Drainage Area = 1.24 mi²

.019 MGD - 1Q10 = 0.030 cfs

High Flow 1Q10 = 0.16 cfs - 0.103 MGD

.022 MGD - 7Q10 = 0.034 cfs

High Flow 7Q10 = 0.18 cfs - 0.116 MGD

.049 MGD - 30Q5 = 0.076 cfs

HM = 0.23 cfs - 0.149 MGD

LF 30Q10 = 0.026 cfs

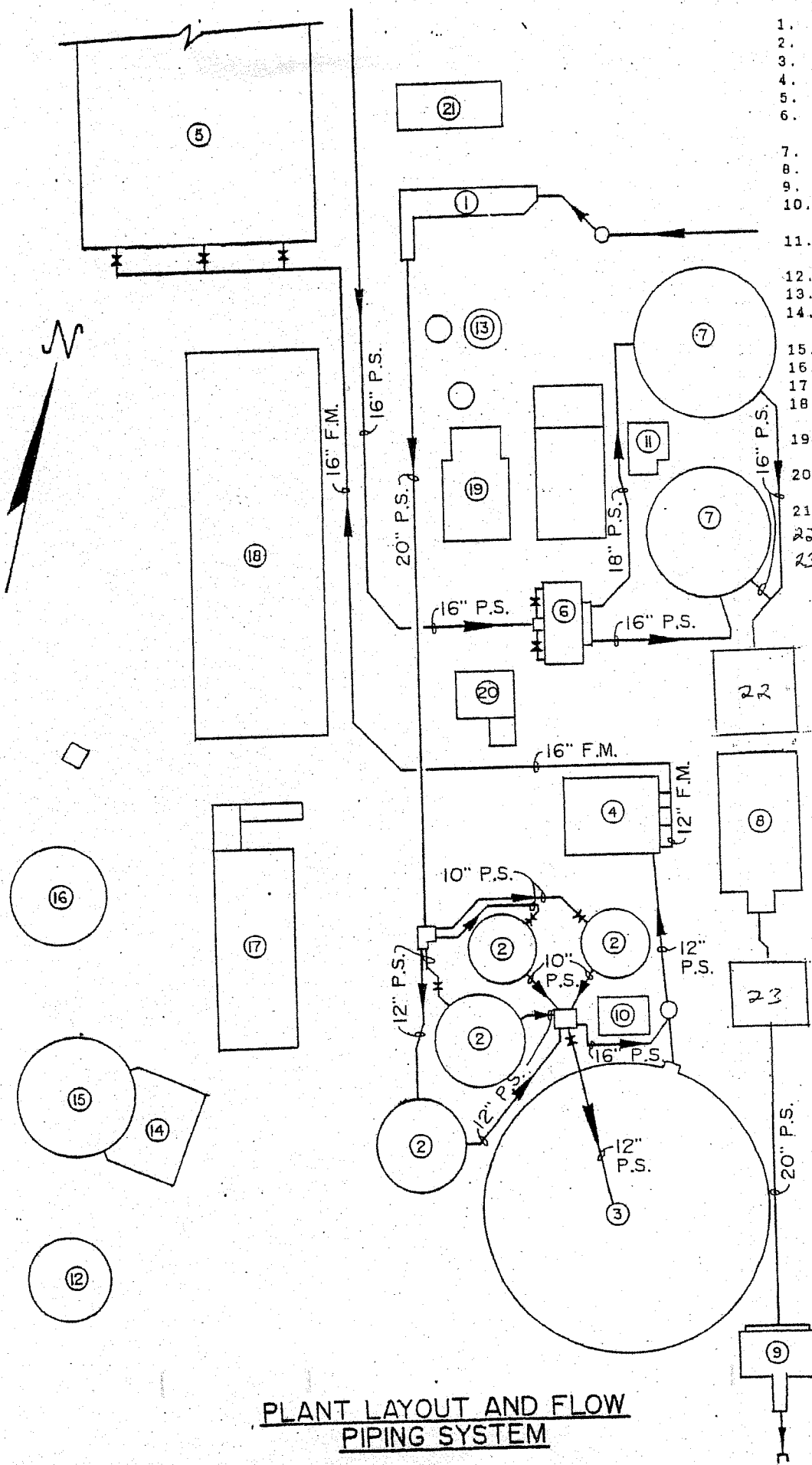
HF 30Q10 = 0.206 MGD

The high flow months are December through May. This analysis assumes there are no significant discharges, withdrawals, or springs influencing the flow in the UT to Great Run upstream of the measurement site.

If you have any questions concerning this analysis, please let me know.

Attachment 1

Amended 2004



1. HEADWORKS
2. PRIMARY CLARIFIER
3. TRICKLING FILTER
4. PLANT PUMP STATION #1
5. RBC UNITS
6. FLASH MIXER & FLOCCULATORS
7. SECONDARY CLARIFIER
8. DENITRIFICATION FILTERS
9. POST AERATION TANK
10. PRIMARY SLUDGE PUMP STATION
11. SECONDARY SLUDGE PUMP STATION
12. SLUDGE THICKENER NO. 1
13. SLUDGE THICKENER NO. 2
14. DIGESTER CONTROL BUILDING
15. PRIMARY DIGESTER
16. SECONDARY DIGESTER
17. CONTROL BUILDING
18. COVERED SLUDGE DRYING BEDS
19. CHEMICAL FEED BUILDING
20. DECHLORINATION BUILDING
21. BLOWER BUILDING
22. PUMP STATION #2
23. UV VAULT

Attachment
2

GREAT RUN STREAM

PLANT LAYOUT AND FLOW
PIPING SYSTEM



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

NORTHERN REGIONAL OFFICE

13901 Crown Court, Woodbridge, Virginia 22193

(703) 583-3800 Fax (703) 583-3801

www.deq.virginia.gov

Preston Bryant
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

May 21, 2008

Mr. Edward B. Tucker
Director of Public Works
Town of Warrenton
P.O. Box 341
Warrenton, VA, 20188

Re: Town of Warrenton STP, Permit VA0021172

Dear Mr. Tucker:

Enclosed are copies of the technical and laboratory inspection reports generated from observations made while performing a Facility Technical Inspection at the Town of Warrenton-Sewage Treatment Plant (STP) on April 23, 2008. The compliance staff would like to thank Bill Stoddard, Jeff Iannarelli and Allen Chichester for their time and assistance during the inspection.

Summaries for both the technical and laboratory inspections are enclosed. The facility had Deficiencies for the laboratory inspection. Please note the requirements and recommendations addressed in the technical summary. Please submit in writing a progress report to this office by **June 23, 2008** for the items addressed. Your response may be sent either via the US Postal Service or electronically, via E-mail. If you chose to send your response electronically, we recommend sending it as an Acrobat PDF or in a Word-compatible, write-protected format. Additional inspections may be conducted to confirm that the facility is in compliance with permit requirements.

If you have any questions or comments concerning this report, please feel free to contact me at the Northern Regional Office (NRO) at (703) 583-3882 or by E-mail at smmack@deq.virginia.gov.

Sincerely,

A handwritten signature in blue ink that reads "Sharon Mack". The signature is fluid and cursive, with the first name "Sharon" and last name "Mack" clearly distinguishable.

Sharon Mack
Environmental Specialist II

cc: Permits / DMR File
 Compliance Manager
 Compliance Auditor
 Compliance Inspector
 OWCP (Steve Stell) – EPA copy

**DEQ
WATER FACILITY INSPECTION REPORT
PREFACE**

VPDES/State Certification No.	(RE) Issuance Date	Amendment Date	Expiration Date																								
VA0021172	February 16, 2005	July 1, 2005	February 15, 2009																								
Facility Name	Address		Telephone Number																								
Warrenton Town Sewage Treatment Plant	731 Frost Ave. Warrenton, VA. 20188		540-347-1104																								
Owner Name	Address		Telephone Number																								
Town of Warrenton	P.O. Box 341 Warrenton, VA. 20188		540-347-1101																								
Responsible Official	Title		Telephone Number																								
Edward B. Tucker, Jr.	Director of Public Works		540-347-1104																								
Responsible Operator	Operator Cert. Class/number		Telephone Number																								
William Stoddard	Class I/1909 000750		540-347-1104																								
TYPE OF FACILITY:																											
<table border="1" style="width: 100%;"> <tr> <td colspan="4" style="text-align: center;">DOMESTIC</td> <td colspan="4" style="text-align: center;">INDUSTRIAL</td> </tr> <tr> <td>Federal</td> <td></td> <td>Major</td> <td>X</td> <td>Major</td> <td></td> <td>Primary</td> <td></td> </tr> <tr> <td>Non-federal</td> <td>X</td> <td>Minor</td> <td></td> <td>Minor</td> <td></td> <td>Secondary</td> <td></td> </tr> </table>				DOMESTIC				INDUSTRIAL				Federal		Major	X	Major		Primary		Non-federal	X	Minor		Minor		Secondary	
DOMESTIC				INDUSTRIAL																							
Federal		Major	X	Major		Primary																					
Non-federal	X	Minor		Minor		Secondary																					
INFLUENT CHARACTERISTICS:				DESIGN:																							
		Flow		2.5 MGD																							
		Population Served		~ 9,000																							
		Connections Served		~ 3,500																							
EFFLUENT LIMITS: Units in mg/L unless otherwise specified.																											
Parameter	Min.	Avg.	Max.	Parameter	Min.	Avg.	Max.																				
Flow (MGD)		2.5		pH (s.u.)	6.0		9.0																				
DO	6.5			TSS		10	15																				
Temperature, ° C		NL	NL	CBOD		10	15																				
E. coli N/CML		126		Ammonia, as N		1.4	1.7																				
Nitrogen, Total (as N)		NL		Nitrate-Nitrite- N		NL																					
TKN		5.0	7.5	Phosphorous, Total (as P)		NL																					
Orthophosphate (as P)		NL																									
		Receiving Stream		UT to Great Run																							
		Basin		Rappahannock River																							
		Discharge Point (LAT)		38° 43' 00"																							
		Discharge Point (LONG)		77° 48' 57"																							

REV 5/00

**DEQ
WASTEWATER FACILITY
INSPECTION REPORT
PART 1**

Inspection date: **April 23, 2008**Date form completed: **May 21, 2008**Inspection by: **Sharon Mack**Inspection agency: **DEQ NRO**Time spent: **25 hrs**Announced: **No**

Reviewed by:

Scheduled: **Yes**

Present at inspection: **Joan Crowther – VA. DEQ**
Bill Stoddard, Jeff Iannarelli, Allen Chichester – Town of Warrenton

TYPE OF FACILITY:

Domestic**Industrial**

☐ Federal ☒ Major
☒ Nonfederal ☐ Minor

☐ Major ☐ Primary
☐ Minor ☐ Secondary

Type of inspection:

☒ Routine
☐ Compliance/Assistance/Complaint
☐ Reinspection

Date of last inspection: **Nov. 14, 2006**
 Agency: **DEQ NRO**

Population served: approx. **9,000**Connections served: approx. **3,500**Last month average: (Effluent) Month/year: **March 2008**

Flow:	1.6	MGD	pH:	7.3	s.u.	Temp:	16	°C
DO (min)	9.5	Mg/L	CBOD ₅	< QL	Mg/L	TSS	2.8	mg/L
E. coli	< QL	n/cml	Ammonia-N	< QL	Mg/L	TKN	0.8	Mg/L
Total Nitrogen	22	Mg/L	NO ₂ -NO ₃	21	Mg/L	Total Phosphate	0.7	Mg/L

Quarter average: (Effluent)

Flow:	1.6	MGD	pH:	7.4	s.u.	Temp:	16	°C
DO (min)	9.5	Mg/L	CBOD ₅	< QL	Mg/L	TSS	3.1	mg/L
E. coli	< 1	n/cml	Ammonia-N	< 0.1	Mg/L	TKN	1.1	Mg/L
Total Nitrogen	25	Mg/L	NO ₂ -NO ₃	24	Mg/L	Total Phosphate	.73	Mg/L

DATA VERIFIED IN PREFACE

☒ Updated ☐ No changes

Has there been any new construction?

☒ Yes ☐ No

If yes, were plans and specifications approved?

☐ Yes ☐ No

See Below

DEQ approval date:

As of May 21, 2008, a Certificate to Operate (CTO) for the UV system has not been issued.

(A) PLANT OPERATION AND MAINTENANCE

1. Class and number of licensed operators: I 3 II 2 III 0 IV 1 Trainee
2. Hours per day plant is manned: **16 hours per day – 2 eight hour shifts**
3. Describe adequacy of staffing. ☒ Good ☐ Average ☐ Poor
4. Does the plant have an established program for training personnel? ☒ Yes ☐ No
5. Describe the adequacy of the training program. ☒ Good ☐ Average ☐ Poor
6. Are preventive maintenance tasks scheduled? ☒ Yes ☐ No
7. Describe the adequacy of maintenance. ☒ Good ☐ Average ☐ Poor*
8. Does the plant experience any organic/hydraulic overloading?
If yes, identify cause and impact on plant: ☐ Yes ☒ No
9. Any bypassing since last inspection? ☒ Yes ☐ No
10. Is the standby electric generator operational? ☒ Yes ☐ No* ☐ NA
11. Is the STP alarm system operational? ☒ Yes ☐ No* ☐ NA
12. How often is the standby generator exercised?
Power Transfer Switch? **Once Weekly**
Alarm System? **Once Weekly**
Once Weekly
13. When was the cross connection control device last tested on the potable water service? **March 27, 2008**
14. Is sludge being disposed in accordance with the approved sludge disposal plan?
☒ Yes ☐ No ☐ NA
15. Is septage received by the facility? ☒ Yes ☐ No **See comments**
Is septage loading controlled? ☒ Yes ☐ No
Are records maintained? ☒ Yes ☐ No
16. Overall appearance of facility: ☒ Good ☐ Average ☐ Poor

Comments:

9. On 12-21-07, the effluent discharged from the plant was not dechlorinated due to a break in the sulfur dioxide dechlorination line. The break was apparently caused by construction activities. Approximately 600,000 gallons of chlorinated effluent was discharged to Great Run.

15. Leachate from the Fauquier County Landfill is received by the plant.

(B) PLANT RECORDS

1. Which of the following records does the plant maintain?

Operational Logs for each unit process	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Instrument maintenance and calibration	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Mechanical equipment maintenance	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
Industrial waste contribution (Municipal Facilities)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA

2. What does the operational log contain?

<input checked="" type="checkbox"/> Visual observations	<input checked="" type="checkbox"/> Flow measurement
<input checked="" type="checkbox"/> Laboratory results	<input checked="" type="checkbox"/> Process adjustments
<input checked="" type="checkbox"/> Control calculations	<input type="checkbox"/> Other (specify)

Comments:

3. What do the mechanical equipment records contain?

<input checked="" type="checkbox"/> As built plans and specs	<input checked="" type="checkbox"/> Spare parts inventory
<input checked="" type="checkbox"/> Manufacturers instructions	<input checked="" type="checkbox"/> Equipment/parts suppliers
<input checked="" type="checkbox"/> Lubrication schedules	<input type="checkbox"/> Other (specify)

Comments:

4. What do the industrial waste contribution records contain?
(Municipal Only)

<input checked="" type="checkbox"/> Waste characteristics	<input checked="" type="checkbox"/> Locations and discharge types
<input type="checkbox"/> Impact on plant	<input type="checkbox"/> Other (specify)

Comments:

5. Which of the following records are kept at the plant and available to personnel?

<input checked="" type="checkbox"/> Equipment maintenance records	<input checked="" type="checkbox"/> Operational Log
<input checked="" type="checkbox"/> Industrial contributor records	<input checked="" type="checkbox"/> Instrumentation records
<input checked="" type="checkbox"/> Sampling and testing records	

6. Records not normally available to plant personnel and their location: **None**

7. Were the records reviewed during the inspection? ☒ Yes ☐ No
8. Are the records adequate and the O & M Manual current? ☒ Yes ☐ No
9. Are the records maintained for the required 3-year time period? ☒ Yes ☐ No

Comments:

8. **A new UV system was installed in late 2007 and began operating in January 2008. An update to the O&M manual to reflect this change was sent to DEQ on March 24, 2008.**

(C) SAMPLING

1. Do sampling locations appear to be capable of providing representative samples? ☒ Yes ☐ No*
2. Do sample types correspond to those required by the VPDES permit? ☒ Yes ☐ No*
3. Do sampling frequencies correspond to those required by the VPDES permit? ☒ Yes ☐ No*
4. Are composite samples collected in proportion to flow? ☒ Yes ☐ No* ☐ NA
5. Are composite samples refrigerated during collection? ☒ Yes ☐ No* ☐ NA
6. Does plant maintain required records of sampling? ☒ Yes ☐ No*
7. Does plant run operational control tests? ☒ Yes ☐ No

Comments:

(D) TESTING

1. Who performs the testing? ☒ Plant ☐ Central Lab ☒ Commercial Lab
DO, pH, TSS **Total P, Orthophosphate**
Ammonia-N **CBOD₅, NO₂, NO₃, TKN**

Name: **ESS - Culpeper****If plant performs any testing, complete 2-4.**

2. What method is used for chlorine analysis? **Until January 2008, a LaMotte Colorimeter**
3. Does plant appear to have sufficient equipment to perform required tests? ☒ Yes ☐ No*
4. Does testing equipment appear to be clean and/or operable? ☒ Yes ☐ No*

Comments:

(E) FOR INDUSTRIAL FACILITIES WITH TECHNOLOGY BASED LIMITS ONLY

1. Is the production process as described in the permit application? (If no, describe changes in comments)
☐ Yes ☐ No ☒ NA
2. Do products and production rates correspond as provided in the permit application? (If no, list differences)
☐ Yes ☐ No ☒ NA
3. Has the State been notified of the changes and their impact on plant effluent? Date:
☐ Yes ☐ No* ☒ NA

Comments:

Problems identified at last inspection:

Corrected

Not Corrected

1. Animal burrows around plant basins and piping pose a potential concern to infrastructure integrity. Burrows should be filled as they are discovered and burrowing animals discouraged.

[]

[X]

While the burrows noted in the previous inspection were filled in by plant staff, new ones have appeared.

SUMMARY

Comments:

- The staff is commended for maintaining a well run facility while construction is underway and for their diligence in meeting permit limits and other compliance items.
- Mr. Stoddard informed us that an updated O&M Manual discussing the new UV system was sent to DEQ on March 24, 2008.
- Construction for the upgraded treatment facilities is underway.

Recommendations for action:

- The DEQ's Northern Regional Office does not have a record of having received either an O&M manual or an engineer's Statement of Completion for the UV system. Both of these items must be received before the Office of Wastewater Engineering can issue a Certificate to Operate (CTO). Action to obtain a CTO for the UV disinfection system must be taken as soon as possible; these actions are explained in the Certificate to Construct issued in February 2007.
- Animals have created burrows around the discharge pipe and the digesters. While the staff had removed groundhogs from the grounds previously, new animals have moved in. The city's engineer was on site during this inspection, and stated that he would have traps brought over to catch the new burrowers. Because of the risk of unbalancing process tanks and compromising the integrity of the tank walls, all process units must be kept free of burrowing animals and vegetation. The town's engineer told Bill on the day of this inspection that he would arrange to have traps placed.
- This is the second inspection in a row in which the weirs of the secondary clarifiers were overgrown with algae. The staff plans to have automatic weir washers installed to address this problem.
- While the sulfur dioxide feed building is still present, all feed systems have been off line since January 2008, when the plant switched from chlorination/dechlorination to UV disinfection.
- Post aeration is currently used between 8 am and 4 pm. However, the O&M manual on file at DEQ's Northern Regional Office indicates continuous aeration of the effluent; the only alternate operation procedure is to be followed if one tank is off line. Please provide documentation that the DO levels in the effluent are sufficient between 4 pm and 8 am and that post aeration is not needed.

UNIT PROCESS: Screening/Comminution

- | | | | | | |
|----|--|--|---|--|--|
| 1. | Number of Units: | Manual: | 1 | Mechanical: | 1 |
| | Number in operation: | Manual: | 0 | Mechanical: | 1 |
| 2. | Bypass channel provided: | | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| | Bypass channel in use: | | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| 3. | Area adequately ventilated: | | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| 4. | Alarm system for equipment failure or overloads: | | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| 5. | Proper flow distribution between units: | | <input type="checkbox"/> Yes | <input type="checkbox"/> No | <input checked="" type="checkbox"/> NA |
| 6. | How often are units checked and cleaned? | | At least once each shift | | |
| 7. | Cycle of operation: | | Timed - runs for about one minute, every three minutes | | |
| 8. | Volume of screenings removed: | | A ½ ton trash container emptied 2 times weekly | | |
| 9. | General condition: | <input checked="" type="checkbox"/> Good | <input type="checkbox"/> Fair | <input type="checkbox"/> Poor | |

Comments:

UNIT PROCESS: Grit Removal

- | | | | | |
|----|---|----------|---|---|
| 1. | Number of units: | 2 | In operation: | 2 |
| 2. | Unit adequately ventilated: | | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* |
| 3. | Operation of grit collection equipment: | | <input type="checkbox"/> Manual | <input checked="" type="checkbox"/> Time clock <input type="checkbox"/> Continuous duty |
| 4. | Proper flow distribution between units: | | <input type="checkbox"/> Yes | <input type="checkbox"/> No* <input checked="" type="checkbox"/> NA |
| 5. | Daily volume of grit removed: | | A ½ ton trash container emptied 2 times weekly | |
| 6. | All equipment operable: | | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* |
| 7. | General condition: | | <input checked="" type="checkbox"/> Good | <input type="checkbox"/> Fair <input type="checkbox"/> Poor |

Comments:

- 1. Run alternately; once every four hours for 15 minutes.**

UNIT PROCESS: Flow Measurement☒ Influent ☐ Intermediate ☐ Effluent

1. Type measuring device: **Parshall flume and Aqua guard ultrasonic meter**
2. Present reading: **2.1 MGD**
3. Bypass channel: ☒ Yes ☐ No
Metered: ☐ Yes ☒ No
4. Return flows discharged upstream from meter: ☐ Yes ☒ No
Identify:
5. Device operating properly: ☒ Yes ☐ No*
6. Date of last calibration: **Feb. 5, 2008**
7. Evidence of following problems:
 - a. obstructions ☐ Yes* ☒ No
 - b. grease ☐ Yes* ☒ No
8. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

UNIT PROCESS: Sedimentation☒ Primary ☐ Secondary ☐ Tertiary

- | | | | | |
|--|----------|--|--|-------------------------------|
| 1. Number of units: | 4 | In operation: | 3 | |
| 2. Proper flow distribution between units: | | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> NA |
| 3. Signs of short circuiting and/or overloads: | | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| 4. Effluent weirs level: | | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| Clean: | | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| 5. Scum collection system working properly: | | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | <input type="checkbox"/> NA |
| 6. Sludge collection system working properly: | | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| 7. Influent, effluent baffle systems working properly: | | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No* | |
| 8. Chemical addition: | | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| Chemicals: | | NA | | |
| 9. Effluent characteristics: | | cloudy grey | | |
| 10. General condition: | | <input checked="" type="checkbox"/> Good | <input type="checkbox"/> Fair | <input type="checkbox"/> Poor |

Comments:

- 1. Clarifier #1 is used during high flow periods.**
- 8. "Strike" is added to the flow stream after the clarifiers in the summer to control filter flies in the trickling filter.**

UNIT PROCESS: Trickling Filters

1. Number of units: **1** In operation: **1**
2. Filter classification: ☐ Low ☐ Intermediate ☒ High ☐ Super High
3. System operated in: ☐ Series ☐ Parallel ☒ NA
4. Biomass color: ☐ Black ☒ Brown ☐ Green ☐ Other
5. Odor: ☐ Septic* ☒ Earthy ☐ None ☐ Other
6. Evidence of following problems:
- | | | |
|------------------------------|--|--|
| a. uneven flow distribution | <input type="checkbox"/> Yes* | <input checked="" type="checkbox"/> No |
| b. filter clogging (ponding) | <input type="checkbox"/> Yes* | <input checked="" type="checkbox"/> No |
| c. nozzles clogging | <input type="checkbox"/> Yes* | <input checked="" type="checkbox"/> No |
| d. icing | <input type="checkbox"/> Yes* | <input checked="" type="checkbox"/> No |
| e. filter flies | <input checked="" type="checkbox"/> Yes* | <input type="checkbox"/> No |
| f. vegetation on filter | <input type="checkbox"/> Yes* | <input checked="" type="checkbox"/> No |
7. Recirculation pumps operating: ☐ Yes ☐ No ☒ NA
8. Recirculation rate: **NA**
9. Proper flow distribution between units: ☐ Yes ☐ No ☒ NA
10. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

- **Odor control only used in summer**

UNIT PROCESS: Sewage Pumping

1. Name of station: **Wet Well Pump Station**
2. Location (if not at STP): **NA**
3. Following equipment operable:

a. all pumps	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No*	
b. ventilation	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No*	
c. control system	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No*	
d. sump pump	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No*	
e. seal water system	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No*	
4. Reliability considerations:

a. Class	<input checked="" type="checkbox"/> I	<input type="checkbox"/> II	<input type="checkbox"/> III
b. Alarm system operable:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No*	
c. Alarm conditions monitored:			
1. high water level	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No*	
2. high liquid level in dry well	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
3. main electric power	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
4. auxiliary electric power	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
5. failure of pump motors to start	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
6. test function	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No*	
7. other	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
d. Backup for alarm system operational:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> NA
e. Alarm signal reported to (identify):	Control/lab building		
f. Continuous operability provisions:			
<input checked="" type="checkbox"/> generator	<input type="checkbox"/> two sources of power		
<input type="checkbox"/> portable pump	<input type="checkbox"/> 1 day storage	<input type="checkbox"/> other	
5. Does station have bypass: ☐ Yes* ☒ No

a. evidence of bypass use	<input type="checkbox"/> Yes*	<input type="checkbox"/> No	<input checked="" type="checkbox"/> NA
b. can bypass be disinfected	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> NA
c. can bypass be measured	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> NA
6. How often is station checked? **Several times daily**
7. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

- **In the past, soda ash has been added for alkalinity adjustment. Staff has not fed soda ash for about 6 months, and have determined that it is not needed at this time.**

UNIT PROCESS: Rotating Biological Contactors

1. Number of units: **21** In operation: **20**
2. Proper flow distribution between units: ☒ Yes ☐ No* ☐ NA
3. Process control testing: **April 2008**
- | | | | |
|----------------------------------|---|--|------------------|
| a. rotation time(full rotation) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | Quarterly |
| b. rotation time(1/4 rotation) | <input type="checkbox"/> Yes | <input checked="" type="checkbox"/> No | |
| c. rotation speed | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | 1.5 rpm |
| d. wastewater temperature | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | 15.5 ° C |
| e. load cell (biomass thickness) | <input type="checkbox"/> Yes | <input type="checkbox"/> No | psi |
| f. D.O. level (1st stage) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | 3.5 mg/L |
| g. D.O. level (last stage) | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | 9.3 mg/L |
4. Biomass color: 1st stage: **Brown**
Last stage: **Brown**
5. Odor: ☐ Septic* ☒ Earthy ☐ None ☐ Other:
6. Mechanical drives and motors operating properly: ☒ Yes ☐ No* ☐ NA
7. Aeration system operating properly: ☒ Yes ☐ No* ☐ NA
8. Uniform rotation of media: ☒ Yes ☐ No*
9. RBC housing adequately ventilated: ☒ Yes ☐ No
10. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

1. Three trains with seven RBCs per train. One RBC down due to bearing failure but scheduled to be fixed.

3.e. RBCs are weighed in psi and converted into total pounds using a chart supplied by the manufacturer to assure that the unit's weight is below the maximum allowable for the shaft. The total pounds value is documented in the plant records.

Only the first three units of each train are weighed because they are the ones that use oxygen.

	Train 1	Train 2	Train 3
Pounds:	#2 13,600 lb	#9 12,750 lb	#15 16,200 lb
	#3 11,200 lb	#10 11,200 lb	#16 12,100 lb
	#4 11,600 lb	#11 10,800 lb	#17 11,600 lb

UNIT PROCESS: Rapid Mix

1. Number of units: **1** In operation: **1**
2. Identify chemicals used and dose: **Polyaluminum Chloride**
3. Proper flow distribution between units: ☐ Yes ☐ No* ☒ NA
4. Adequate mixing: ☒ Yes ☐ No*
5. Proper baffling: ☒ Yes ☐ No*
6. Motors operating properly: ☒ Yes ☐ No*
7. Type of chemical feed system: ☐ Manual ☒ Automatic
8. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

UNIT PROCESS: Slow Mix

1. Number of units: **2** In operation: **2**
2. Identify chemicals used and dose: **Polymer**
3. Proper flow distribution between units: ☒ Yes ☐ No* ☐ NA
4. Adequate mixing: ☒ Yes ☐ No*
5. Proper baffling: ☒ Yes ☐ No*
6. Motors operating properly: ☒ Yes ☐ No*
7. Type of chemical feed system: ☐ Manual ☐ Automatic ☒ NA
8. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

- 8. There was vegetation growing in the flocculation tanks. Some of this was duckweed, the other was a stemmed plant that should be removed from the tank.**

UNIT PROCESS: Sedimentation[] Primary **[X]** Secondary [] Tertiary

1. Number of units: **2** In operation: **2**
2. Proper flow distribution between units: **[X]** Yes [] No* [] NA
3. Signs of short circuiting and/or overloads: [] Yes **[X]** No
4. Effluent weirs level: **[X]** Yes [] No*
 Clean: [] Yes **[X]** No*
5. Scum collection system working properly: **[X]** Yes [] No* [] NA
6. Sludge collection system working properly: **[X]** Yes [] No*
7. Influent, effluent baffle systems working properly: **[X]** Yes [] No*
8. Chemical addition: [] Yes **[X]** No
 Chemicals:
9. Effluent characteristics: **Clear**
10. General condition: [] Good **[X]** Fair [] Poor

Comments:

- 4. While the weirs are cleaned regularly, staff was not able at the time to recycle water used in washing the weirs back through the plant for treatment, so the algae is growing back very quickly and they could not keep up with manual washing. The staff plans to have automatic weir washers installed to address this problem.**

This is the second inspection in a row in which the weirs of the secondary clarifiers were overgrown with algae. In the technical inspection report for November 2006 it is noted that staff was not cleaning the clarifier weirs because of concern over algae clogging the nitrogen filter intake during the nitrogen removal pilot program they were running.

- 10. The weirs appear to be fine structurally.**

UNIT PROCESS: Ultraviolet (UV) Disinfection

- | | |
|--|---|
| 1. Number of UV lamps/assemblies: 2 | In operation: 2 |
| 2. Type of UV system and design dosage: | Aquionics Inline™ |
| 3. Proper flow distribution between units: | [X] Yes <input type="checkbox"/> No* <input type="checkbox"/> NA |
| 4. Method of UV intensity monitoring: | Lamp output is checked on the control panel every 4 hours; bacti monitoring. |
| 5. Adequate ventilation of ballast control boxes: | [X] Yes <input type="checkbox"/> No* <input type="checkbox"/> NA |
| 6. Indication of on/off status of all lamps provided: | [X] Yes <input type="checkbox"/> No* |
| 7. Lamp assemblies easily removed for maintenance: | [X] Yes <input type="checkbox"/> No* |
| 8. Records of lamp operating hours and replacement dates provided: | <input type="checkbox"/> Yes <input type="checkbox"/> No* |
| 9. Routine cleaning system provided: | [X] Yes <input type="checkbox"/> No* |
| Operate properly: | [X] Yes <input type="checkbox"/> No* |
| Frequency of routine cleaning: | System is self cleaning and regularly monitored |
| 10. Lamp energy control system operate properly: | [X] Yes <input type="checkbox"/> No* |
| 11. Date of last system overhaul: | NA |
| a. UV unit completely drained | <input type="checkbox"/> Yes <input type="checkbox"/> No* |
| b. all surfaces cleaned | <input type="checkbox"/> Yes <input type="checkbox"/> No* |
| c. UV transmissibility checked | <input type="checkbox"/> Yes <input type="checkbox"/> No* |
| d. output of selected lamps checked | <input type="checkbox"/> Yes <input type="checkbox"/> No* |
| e. output of tested lamps | |
| f. total operating hours, oldest lamp/assembly | |
| g. number of spare lamps and ballasts available: lamps: | ballasts: |
| 12. UV protective eyeglasses provided: | <input type="checkbox"/> Yes [X] No* |
| 13. General condition: | [X] Good <input type="checkbox"/> Fair <input type="checkbox"/> Poor |

Comments:

7. If a bulb burns out, an alarm is sent to the control building/lab. Bulbs are replaced by maintenance personnel- the flow through the unit is shut off (backs up to the trickling filter) and the system shut down for bulb replacement.

8, 11. The UV system went on-line in January 2008 and little has been needed yet regarding bulb hours and replacement.

12. The staff believe the UV goggles are not needed because the UV bulbs are enclosed, and the system is turned off and locked/tagged out when maintenance is being conducted.

- The sulfur dioxide building is off line-no chlorination or dechlor since UV went in.**

UNIT PROCESS: Post Aeration

1. Number of units: **2** In operation: **1**
2. Proper flow distribution between units: ☐ Yes ☐ No* ☒ NA
3. Evidence of following problems:
 - a. dead spots ☐ Yes* ☒ No
 - b. excessive foam ☐ Yes* ☒ No
 - c. poor aeration ☐ Yes* ☒ No
 - d. mechanical equipment failure ☐ Yes* ☒ No ☐ NA
4. How is the aerator controlled? ☒ Time clock ☐ Manual ☐ Continuous ☐ Other*
☐ NA
5. What is the current operating schedule? **Post aeration is used between 8 am and 4 pm.**
6. Step weirs level: ☐ Yes ☐ No ☒ NA
7. Effluent D.O. level: **DO measured in lab at ~ 1105**
Measured by Jeff Iannarelli – 9.4 mg/L @ 16.6 °C
Measured by S. Mack – 9.27 mg/L @ 19.4°C
8. General condition: ☒ Good ☐ Fair ☐ Poor

Comments

2. Tanks are alternated monthly.**5. The O&M manual on file at DEQ's Northern Regional Office indicates continuous aeration of the effluent; the only alternate operation procedure discussed is to be followed if one tank is off line.**

UNIT PROCESS: Flow Measurement☐ Influent ☐ Intermediate ☒ Effluent

1. Type measuring device: **Parshall Flume with ultrasonic flow measurement**
2. Present reading: **1.730 MGD**
3. Bypass channel: ☐ Yes ☒ No
Metered: ☐ Yes ☐ No ☒ NA
4. Return flows discharged upstream from meter: ☐ Yes ☒ No
Identify:
5. Device operating properly: ☒ Yes ☐ No*
6. Date of last calibration: **Feb. 5, 2008**
7. Evidence of following problems:
 - a. obstructions ☐ Yes* ☒ No
 - b. grease ☐ Yes* ☒ No
8. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

UNIT PROCESS: Effluent/Plant Outfall

1. Type Outfall ☒ Shore based ☐ Submerged
2. Type if shore based: ☐ Wingwall ☒ Headwall ☒ Rip Rap
3. Flapper valve: ☐ Yes ☒ No ☐ NA
4. Erosion of bank: ☐ Yes ☒ No ☐ NA
5. Effluent plume visible? ☒ Yes* ☐ No
6. Condition of outfall and supporting structures: ☐ Good ☒ Fair ☐ Poor*
7. Final effluent, evidence of following problems:
 - a. oil sheen ☐ Yes* ☒ No
 - b. grease ☐ Yes* ☒ No
 - c. sludge bar ☐ Yes* ☒ No
 - d. turbid effluent ☐ Yes* ☒ No
 - e. visible foam ☒ Yes* ☐ No
 - f. unusual color ☐ Yes* ☒ No

Comments:

5, 7. Suds/foam which quickly dissipates.

6. Burrows around the discharge pipe.

UNIT PROCESS: Sludge Pumping

1. Number of Pumps: **2** In operation: **2**
2. Type of sludge pumped: ☒ Primary ☐ Secondary ☐ Return Activated
☐ Combination ☐ Other:
3. Type of pump: ☒ Plunger ☐ Diaphragm ☐ Screwlift ☐ Centrifugal
☐ Progressing Cavity ☐ Other:
4. Mode of operation: ☒ Manual ☐ Automatic ☐ Other(explain):
5. Sludge volume pumped: **18,000 gals/day**
6. Alarm system for equipment failures or overloads operational: ☒ Yes ☐ No ☐ NA
7. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

Primary Sludge Station

UNIT PROCESS: Sludge Pumping

1. Number of Pumps: **2** In operation: **2**
2. Type of sludge pumped: ☐ Primary ☒ Secondary ☐ Return Activated
☐ Combination ☐ Other:
3. Type of pump: ☒ Plunger ☐ Diaphragm ☐ Screwlift ☐ Centrifugal
☐ Progressing Cavity ☐ Other:
4. Mode of operation: ☐ Manual ☒ Automatic ☐ Other(explain):
5. Sludge volume pumped: **18,000 gals/day**
6. Alarm system for equipment failures or overloads operational: ☒ Yes ☐ No ☐ NA
7. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

Secondary Sludge Station

UNIT PROCESS: Gravity Thickening

1. Number of units: **1** In operation: **1**
2. Types of sludge(s) fed to the thickener:
☐ Primary ☐ WAS ☒ Combination ☐ Other:
3. Solids concentration in the influent sludge: **Primary = 2.7% Secondary = 1.5%**
Thickened sludge: **3 - 4 %**
4. Sludge feeding: ☐ Continuous ☒ Intermittent
5. Signs of short-circuiting and/or overloads: ☐ Yes* ☒ No
6. Effluent weirs level: ☒ Yes ☐ No*
7. Sludge collection system work properly: ☒ Yes ☐ No*
8. Influent, effluent baffle systems work properly: ☒ Yes ☐ No*
9. Chemical addition: ☐ Yes ☒ No
Identify chemical, dose: **NA**
10. General condition: ☐ Good ☒ Fair ☐ Poor

Comments:

10. This unit is hard to closely evaluate because it's dark under the odor control dome. However, there appeared to be a good amount of paper/plastics on the surface. Allen stated that they had scheduled a vacuum truck to clean out these "rags".

Animal burrows abutting the outside tank walls were noted.

- **Odor control is used year round**

UNIT PROCESS: Anaerobic Digestion

1. Number of units: **2** In operation: **2**
2. Type of sludge digested: **Combination primary & secondary from gravity thickener.**
3. Type of digester: ☐ Primary ☐ High rate ☒ Secondary ☐ Standard rate
4. Frequency of sludge application to digestors: **Hourly**
5. Number of recirculation pumps: **2** In operation: **1**
6. Sludge retention time: **~ 30 days**
7. Provisions for pH adjustment: ☒ Yes ☐ No
Utilized: ☒ Yes ☐ No ☐ NA
8. Location of supernatant return in the plant: ☐ Head ☒ Primary ☐ Other(specify):
Supernatant return rate: **See Comments**
9. Gas production rate: **12,000 cubic feet per day**
10. Process control testing: **April 2008**
 - a. reduction of volatile solids: ☒ Yes ☐ No **49 %**
 - b. volatile acids: ☒ Yes ☐ No **56 mg/L**
 - c. pH: ☒ Yes ☐ No **7.4 S.U.**
 - d. temperature: ☒ Yes ☐ No **186-254 °F**
 - e. alkalinity: ☒ Yes ☐ No
11. Signs of overloading: ☐ Yes* ☒ No
12. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

- 1. One primary digester does the digesting; a secondary digester acts mostly as a sludge holding tank, although some digestion takes place.**
- 5. One in operation and one kept in standby.**
- 7. Soda ash added as needed.**
- 8. There is no supernatant from the primary digester. Supernatant is returned from the secondary digester/holding tank to the influent line just prior to the primary clarifier splitter box.**
- 9. Gas is used in plant furnaces and excess burned off.**
- 12. There were burrows next to the outside walls of the primary digester.**

UNIT PROCESS: Pressure Filtration (Sludge)

1. Number of units: **1** In operation: **1**
2. Percent solids in influent sludge: **3-4%**
3. Percent solids in discharge cake: **16%**
4. Filter run time: **4-6 hours per shift; 8-12hrs/day**
5. Amount cake produced: **15,000 -20,000 lb/day**
6. Conditioning chemicals used: **Polymer**
Dose:
7. Sludge pumping: ☒ Manual ☐ Automatic
8. Recirculating system included on acid wash: ☐ Yes ☐ No ☒ NA
9. Signs of overloads: ☐ Yes* ☒ No
10. General condition: ☒ Good ☐ Fair ☐ Poor

Comments:

Sludge is hauled and land applied by Recyc Systems

**DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
LABORATORY INSPECTION REPORT**

10/01

FACILITY NO: VA0021172	INSPECTION DATE: April 23, 2008	PREVIOUS INSP. DATE: Nov. 14, 2006	PREVIOUS EVALUATION: Deficiencies	TIME SPENT: 5 hrs
NAME/ADDRESS OF FACILITY: Town of Warrenton Sewage Treatment Plant 731 Frost Ave. Warrenton, VA. 20188		FACILITY CLASS: (X) MAJOR () MINOR () SMALL () VPA/NDC	FACILITY TYPE: (X) MUNICIPAL () INDUSTRIAL () FEDERAL () COMMERCIAL LAB	UNANNOUNCED INSPECTION? (X) YES () NO FY-SCHEDULED INSPECTION? (X) YES () NO
INSPECTOR(S): Sharon Mack		REVIEWERS:	PRESENT AT INSPECTION: Jeff Iannarelli	

LABORATORY EVALUATION		DEFICIENCIES?	
		Yes	No
LABORATORY RECORDS		X	
GENERAL SAMPLING & ANALYSIS			X
LABORATORY EQUIPMENT			X
DISSOLVED OXYGEN ANALYSIS PROCEDURES			X
pH ANALYSIS PROCEDURES		X	
TOTAL SUSPENDED SOLIDS ANALYSIS PROCEDURES			X
AMMONIA-N ANALYSIS PROCEDURES			X

QUALITY ASSURANCE/QUALITY CONTROL			
Y/N	QUALITY ASSURANCE METHOD	PARAMETERS	FREQUENCY
N	REPLICATE SAMPLES	pH, DO	Once every 20 analyses
Y	REPLICATE SAMPLES	AMMONIA-N	Each run
Y	SPIKED SAMPLES	AMMONIA-N	Each run
Y	STANDARD SAMPLES	pH	Each day of analysis
N	SPLIT SAMPLES		
Y	SAMPLE BLANKS	AMMONIA-N	Each run
N	OTHER		
Y	EPA-DMR QA DATA?	RATING: () No Deficiency (X) Deficiency () NA	
N	QC SAMPLES PROVIDED?	RATING: () No Deficiency () Deficiency (X) NA	

LABORATORY RECORDS SECTION

LABORATORY RECORDS INCLUDE THE FOLLOWING:

<input checked="" type="checkbox"/>	SAMPLING DATE	<input checked="" type="checkbox"/>	ANALYSIS DATE	<input checked="" type="checkbox"/>	CONT MONITORING CHART
<input checked="" type="checkbox"/>	SAMPLING TIME	<input checked="" type="checkbox"/>	ANALYSIS TIME	<input checked="" type="checkbox"/>	INSTRUMENT CALIBRATION
<input checked="" type="checkbox"/>	SAMPLE LOCATION	<input checked="" type="checkbox"/>	TEST METHOD	<input checked="" type="checkbox"/>	INSTRUMENT MAINTENANCE
				<input checked="" type="checkbox"/>	CERTIFICATE OF ANALYSIS

WRITTEN INSTRUCTIONS INCLUDE THE FOLLOWING:

<input checked="" type="checkbox"/>	SAMPLING SCHEDULES	<input checked="" type="checkbox"/>	CALCULATIONS	<input checked="" type="checkbox"/>	ANALYSIS PROCEDURES
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	YES	NO	N/A
DO ALL ANALYSTS INITIAL THEIR WORK?	<input checked="" type="checkbox"/>		
DO BENCH SHEETS INCLUDE ALL INFORMATION NECESSARY TO DETERMINE RESULTS?	<input checked="" type="checkbox"/>		
IS THE DMR COMPLETE AND CORRECT? MONTH(S) REVIEWED: March 2008	<input checked="" type="checkbox"/>		
ARE ALL MONITORING VALUES REQUIRED BY THE PERMIT REPORTED?	<input checked="" type="checkbox"/>		

GENERAL SAMPLING AND ANALYSIS SECTION

	YES	NO	N/A
ARE SAMPLE LOCATION(S) ACCORDING TO PERMIT REQUIREMENTS?	<input checked="" type="checkbox"/>		
ARE SAMPLE COLLECTION PROCEDURES APPROPRIATE?	<input checked="" type="checkbox"/>		
IS SAMPLE EQUIPMENT CONDITION ADEQUATE?	<input checked="" type="checkbox"/>		
IS FLOW MEASUREMENT ACCORDING TO PERMIT REQUIREMENTS?	<input checked="" type="checkbox"/>		
ARE COMPOSITE SAMPLES REPRESENTATIVE OF FLOW?	<input checked="" type="checkbox"/>		
ARE SAMPLE HOLDING TIMES AND PRESERVATION ADEQUATE?	<input checked="" type="checkbox"/>		
IF ANALYSIS IS PERFORMED AT ANOTHER LOCATION, ARE SHIPPING PROCEDURES ADEQUATE? LIST PARAMETERS AND NAME & ADDRESS OF LAB: CBOD₅, TKN, NO₂+NO₃, TP, Orthophosphate ESS 218 North Main St Culpeper, VA	<input checked="" type="checkbox"/>		

LABORATORY EQUIPMENT SECTION

	YES	NO	N/A
IS LABORATORY EQUIPMENT IN PROPER OPERATING RANGE?	<input checked="" type="checkbox"/>		
ARE ANNUAL THERMOMETER CALIBRATION(S) ADEQUATE?	<input checked="" type="checkbox"/>		
IS THE LABORATORY GRADE WATER SUPPLY ADEQUATE?			<input checked="" type="checkbox"/>
ARE ANALYTICAL BALANCE(S) ADEQUATE?	<input checked="" type="checkbox"/>		

LABORATORY INSPECTION REPORT SUMMARY

FACILITY NAME: Town of Warrenton STP	FACILITY NO: VA0021172	INSPECTION DATE: April 23, 2008
<input checked="" type="checkbox"/> Deficiencies	<input type="checkbox"/> No Deficiencies	
LABORATORY RECORDS		
<p style="text-align: center;">The Laboratory Records section had One Deficiency noted during the inspection.</p> <ul style="list-style-type: none"> The benchsheet for the Ammonia-N analysis does not record units of measurement. <p>RECCOMENDATIONS:</p> <ul style="list-style-type: none"> All benchsheets should include the edition of standard methods as well as the method number for each analysis. Additionally, the ammonia analysis benchsheet should be revised to reflect that the results are recorded as Ammonia-N or NH3-N. 		
GENERAL SAMPLING AND ANALYSIS		
<p style="text-align: center;">The General Sampling and Analysis section had No Deficiencies noted during the inspection.</p> <p>RECCOMENDATION:</p> <ul style="list-style-type: none"> Review of the Chain of Custody forms for samples sent to ESS do not indicate that samples to be analyzed for the parameter of Orthophosphate (OP) have been filtered before shipment to the contracted laboratory. 40 CFR 136, Table II – Required Containers, Preservation Techniques, and Holding Times, states that samples for this analysis must be filtered within 15 minutes of collection. Composite samples must be filtered within 15 minutes of collection of the final aliquot. If not already followed, this practice must begin with the next composite samples collected. 		
LABORATORY EQUIPMENT		
<p style="text-align: center;">The Laboratory Equipment section had No Deficiencies noted during the inspection.</p>		
INDIVIDUAL PARAMETERS		
<p style="text-align: center;">pH</p> <p style="text-align: center;">The analysis for the parameter of pH had No Deficiencies noted during the inspection.</p> <p>Note:</p> <ul style="list-style-type: none"> Duplicates have not been run after every 20 samples. The lab does not have a written procedure for reporting sample or duplicate on the DMR. 		
<p style="text-align: center;">DO</p> <p style="text-align: center;">The analysis for the parameter of Dissolved Oxygen (DO) had No Deficiencies noted during the inspection.</p> <p>Note:</p> <ul style="list-style-type: none"> Duplicates have not been run after every 20 analyses. 		

LABORATORY INSPECTION REPORT SUMMARY CONTINUED

FACILITY NAME: Town of Warrenton STP	FACILITY NO: VA0021172	INSPECTION DATE: April 23, 2008
COMMENTS		
<p style="text-align: center;">TSS</p> <p>The analysis for the parameter of Total Suspended Solids (TSS) had No Deficiencies noted during the inspection.</p> <p>RECCOMENDATIONS:</p> <p>Of the 17 final effluent samples collected during the month of March 2008, results ranged from 2.0 – 4.6 mg/L, sample size was consistently 500 ml, and filtering times ranged from 2 – 4 minutes. SM 2540-D requires a filter yield of 10.0 to 200 mg/L or at least 1000 ml of sample must be filtered, as long as filtration time does not exceed 10 minutes. While the DEQ understands that the staff have concerns about filter flies interfering with the analysis results, sample volumes should meet the above criteria as closely as possible</p>		
<p style="text-align: center;">Ammonia-N</p> <p>The ammonia analysis is usually done during the 2nd shift on Mondays; the regular analyst was not on duty at the time of the inspection. The laboratory documentation was reviewed, but the actual analysis was not observed.</p> <p>The analysis for the parameter of Ammonia-N had No Deficiencies noted during the inspection.</p>		
<p>The staff should check the DEQ website at http://www.deq.state.va.us/vpdes/checklist.html and download the most recent inspection check sheets to keep up to date with changes in minimal laboratory requirements. Sheets have been updated as recently as March 2008.</p>		

ANALYST:	Jeff Iannarelli	VPDES NO	VA0021172
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Parameter: Hydrogen Ion (pH)
Method: Electrometric
01/08

Meter: **Fisher Accumet 950**

METHOD OF ANALYSIS

X	18 th Edition of Standard Methods-4500-H-B
	21 st or On-Line Edition of Standard Methods-4500-H-B (00)

pH is a method defined analyte so modifications are not allowed. [40 CFR Part 136.6]

- 1) Is a certificate of operator competence or initial demonstration of capability available for each analyst/operator performing the analysis? **NOTE:** Analyze 4 samples of known pH. May use external source of buffer (different lot/manufacturer than buffers used to calibrate meter). Recovery for each of the 4 samples must be ± 0.1 SU of the known concentration of the sample. [SM 1020 B.1]
- 2) Is the electrode in good condition (no chloride precipitate, etc.)? [2.b/c and 5.b]
- 3) Is electrode storage solution in accordance with manufacturer's instructions? [Mfr.]
- 4) Is meter calibrated on at least a daily basis using three buffers all of which are at the same temperature? [4.a] NOTE: Follow manufacturer's instructions.
- 5) After calibration, is a buffer analyzed as a check sample to verify that calibration is correct? Agreement should be within ± 0.1 SU. [4.a]
- 6) Do the buffer solutions appear to be free of contamination or growths? [3.1]
- 7) Are buffer solutions within their listed shelf life or have they been prepared within the last 4 weeks? [3.a]
- 8) Is the cap or sleeve covering the access hole on the reference electrode removed when measuring pH? [Mfr.]
- 9) For meters with ATC that also have temperature display, was the thermometer calibrated annually? [SM2550 B.1]
- 10) Is the temperature of buffer solutions and samples recorded when determining pH? [4.a]
- 11) Is sample analyzed within 15 minutes of collection? [40 CFR 136.6]
- 12) Was the electrode rinsed and then blotted dry between reading solutions (Disregard if a portion of the next sample analyzed is used as the rinse solution)? [4.a]
- 13) Is the sample stirred gently at a constant speed during measurement? [4.b]
- 14) Does the meter hold a steady reading after reaching equilibrium? [4.b]
- 15) Is a duplicate sample analyzed after every 20 samples if citing 18th or 19th Edition [1020 B.6] or after every 10 samples for 20th or 21st Edition [Part 1020] Note: Not required for *in situ* samples.
- 16) Is pH of duplicate samples within 0.1 SU of the original sample? [Part 1020]
- 17) Is there a written procedure for which result will be reported on DMR (Sample or Duplicate) and is this procedure followed? [DEQ]

Y	N
X	
X	
X	
X	
X	
X	
X	
X	
X	
X	
X	
X	
	X
NA	
	X

PROBLEMS:	15) Duplicates have not been run after every 20 samples. 17) The lab does not have a written procedure for reporting sample or duplicate on the DMR.
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ANALYST:	Jeff Iannarelli	VPDES NO.	VA0021172
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Parameter: Dissolved Oxygen
Method: Electrode
Facility Elevation - 496 ft
01/08

Meter: YSI 58

METHOD OF ANALYSIS:

X	18 th Edition of Standard Methods-4500-O G
	21 st or Online Editions of Standard Methods-4500-O G (01)

DO is a method defined analyte so modifications are not allowed. [40 CFR Part 136.6]

	Y	N
1) If samples are collected, is collection carried out with a minimum of turbulence and air bubble formation and is the sample bottle allowed to overflow several times its volume? [B.3]	X	
2) Are meter and electrode operable and providing consistent readings? [3]	X	
3) Is membrane in good condition without trapped air bubbles? [3.b]	X	
4) Is correct filling solution used in electrode? [Mfr.]	X	
5) Are water droplets shaken off the membrane prior to calibration? [Mfr.]	X	
6) Is meter calibrated before use or at least daily? [Mfr.]	X	
7) Is calibration procedure performed according to manufacturer's instructions? [Mfr.]	X	
8) Is sample stirred during analysis? [Mfr.]	X	
9) Is the sample analysis procedure performed according to manufacturer's instructions? [Mfr.]	X	
10) Is meter stabilized before reading D.O.? [Mfr.]	X	
11) Is electrode stored according to manufacturer's instructions? [Mfr.]	X	
12) Is a duplicate sample analyzed after every 20 samples if citing 18 th or 19 th Edition [1020 B.6] or after every 10 samples for 20 th or 21 st Edition [Part 1020] Note: Not required for <i>in situ</i> samples.		X
13) If a duplicate sample is analyzed, is the reported value for that sampling event, the average concentration of the sample and the duplicate? [DEQ]	NA	
14) If a duplicate sample is analyzed, is the relative percent difference (RPD) < 20? [18 th ed. Table 1020 I; 21 st ed. DEQ]	NA	

PROBLEMS:	12) Duplicates have not been run after every 20 analyses.
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VA0021172

02-06

USGS-METHODS IN WATER AND FLUVIAL SEDIMENTS-I-3765-85

20) Is the sufficiency of the drying time checked periodically? (VPDES permit holders conducting their testing must verify the adequacy of drying time by multiple weighings once per year. Laboratories must reweigh each sample or maintain records for each client/outfall documenting drying time adequacy. These records must be updated annually.) [Permit]

	Y	N
21) Are all weights recorded on laboratory bench sheets? [Permit]	X	
22) Was filter yield between 10.0 mg and 200 mg, or filter at least 1000 mLs of sample? [SM-3.b]		X
23) Is the sample value calculated correctly? [SM-4; 160.2-8] $\text{TSS (mg/L)} = \frac{(A - B) \times 1000 \text{ mL/L}}{\text{sample volume (mL)}}$ <p>A = weight of filter + dried residue (mg) B = weight of filter (mg)</p>	X	
24) Were duplicates analyzed on 5% of samples? Did the results of the duplicate samples agree within 5% of their average? [SM 2540 D-3.c, SM 1020 B-6 & ; Permit]	X	

COMMENTS:	<ul style="list-style-type: none"> Analysis was discussed but not observed – samples are run once per week. Sufficiency of drying time was run on 4-3-08. The benchsheet documenting the sufficiency of drying time was difficult to interpret- I recommend that it be modified to clearly show that the effluent sample was dried and weighed more than once with a final weight difference of less than 4% of the previous weight or 0.5 mg, whichever is less (as per SM 2540 D 18th ed.).
PROBLEMS:	22) Of the 17 final effluent samples collected during the month of March 2008, results ranged from 2.0 – 4.6 mg/L, sample size was consistently 500 ml, and filtering times ranged from 2 – 4 minutes. SM 2540-D requires a filter yield of 10.0 to 200 mg/L or at least 1000 ml of sample must be filtered, as long as filtration time does not exceed 10 minutes. While the DEQ understands that the staff have concerns about filter flies interfering with the analysis results, sample volumes should meet the above criteria as closely as possible.

ANALYST:	Richard Green	VPDES NO	VA0022802
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Parameter: Ammonia Nitrogen
Method: Ion Specific Electrode
 04/02

METHOD OF ANALYSIS:

X	18 th Edition of Standard Methods 4500NH ₃ -F
	EPA Methods for Chemical Analysis 350.3
	ASTM D1426-89(B)

		Y	N
1)	Is analysis performed with a pH meter with an expanded millivolt scale capable of 0.1 mV resolution between – 700 mV and + 700 mV or an ion specific meter? [SM-2.a; 350.3-5.1]		
2)	Is a Teflon coated stirrer bar and magnetic stirrer used during analysis? [SM-2.c; 350.3-5.3]		
3)	Is a thermally insulated magnetic stirrer used during analysis? [SM-2.c; 350.3-5.3]		
4)	Is the electrode used an Orion Model 95-12 or 95-10, EIL Model 8002-2, Beckman Model 39565 or equivalent? [SM-2.a; 350.3-5.2]		
5)	For short term storage (week or less) is probe stored as specified in the manufacturers instructions? [Mfr]	X	
6)	For long term storage (longer than one week) is the electrode drained, rinsed with distilled water and stored dry? [Mfr]		
7)	Is ammonia free water used for all aspects of the procedure? [SM-3.a; 350.3-6.1]		
8)	Is stock ammonia standard (1000 mg/L N or 0.1 M) free from growths or precipitates? [GLP]		
9)	Are standards prepared using Class A volumetric glassware? [SM-1070 B.2; Permit]		
10)	Is 1 mL of 10N NaOH (2 mL of 5N NaOH) added <u>after</u> the electrode has been placed in the sample? [SM-4.b; 350.3-7.2]		
11)	Is the pH of the sample \geq 11 SU after the addition of the 10N NaOH? [SM-4.b; 350.3-7.2]		
12)	Is the linearity of the calibration curve determined appropriately and is it \geq 0.995? [SM-4.c; 350.3-7.3]		
13)	Are direct readout meters calibrated according to manufacturer's instructions? [Mfr.]		
14)	Are standards and samples read from lowest to highest concentration? [SM-4.b; 350.3-7.2]		
15)	Is the instrument slope documented to be within manufacturer's specifications each sample run? (Corning -55 \pm 5 mV, Orion -57 \pm 3 mV, Accumet -59 \pm 4 mV, Hach -58 \pm 4 mV) [Mfr.]		
16)	Is the electrode rinsed with distilled water and blotted dry between measurements? [Permit]		
17)	Are samples and standards stirred so that bubbles are not sucked in the solution? [SM-4.b; Permit]		
18)	Is the electrode held at a 20 – 30 degree angle in the sample during analysis? [Mfr]		
19)	Is the electrode tip free of bubbles during operation? [Permit]		
20)	Is a new curve drawn when calibration standards are not within \pm 5.0% of the existing curve? [Permit]	X	

- 21) Are results recorded as soon as the meter stabilizes? [SM-4.b; 350.3-7.2]
- 22) Are results recorded in terms of ammonia nitrogen? [SM-4.3; 350.3-7.5]
- 23) Are standards and samples at the same temperature when analyzed? [SM-1.b; Permit]
- 24) Are all calibrations, calculations, temperatures recorded? [Permit]

Y	N
X	
X	
X	

COMMENTS:	<ul style="list-style-type: none"> Analysis is run by an operator on the evening shift (Monday evenings). The paperwork was reviewed for this inspection, but the analysis was not discussed or observed. IDC was done December 3rd and 4th 2008 for all operators. However, dates were not recorded for Richard Green, the operator who is the main analyst for this parameter. <p>20) New calibration curve is created for each run.</p>
PROBLEMS:	<ul style="list-style-type: none"> No units of measurement are recorded on the bench sheets.

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION

ANALYTICAL BALANCE CHECK SHEET

09/05

FACILITY NAME:	Town of Warrenton STP		VPDES NO	VA0021172	DATE:	April 23, 2008
ANALYTICAL BALANCE 1						
SPECIFICATION/TYPE/USE:	Mettler AE 200					
QUESTION:	YES	NO	DATE/COMMENT			
BALANCE SERVICED YEARLY? [SM1020 C.1; Permit]	X		Feb. 29, 2008 by Mettler Toledo tech C. Duncan			
BALANCE LEVEL? [Permit]	X					
BALANCE ZEROED BEFORE USE? [Permit]	X					
BALANCE OPERATED PROPERLY? [Mfr.]	X					
BALANCE LOCATION APPROPRIATE? [Permit]	X					
BALANCE CHECKED DAILY WITH 2 CERTIFIED WEIGHTS? [SM1020; Permit]	X					
CLASS 1- 2 WEIGHTS RECERTIFIED YEARLY? [NIST]		X	March 2007.			
BALANCE SURFACES CLEAN? [Permit]	X					
DEQ BALANCE CHECK						
WT. 1 TRUE	10.0 g	WT. 2 TRUE	1.0 g			
WT. 1 CHECK	9.9999 g	WT. 2 CHECK	0.9998 g			

PROBLEMS:

- The certified weights were past their expiration date. The staff orders new certified weights annually. New weights were on order at the time of inspection but had not arrived (on backorder).

**DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
EQUIPMENT TEMPERATURE LOG/THERMOMETER CALIBRATION CHECK SHEET**

01-08

FACILITY NAME:	Town of Warrenton STP				VPDES NO:	VA0021172				DATE:	April 23, 2008			
EQUIPMENT	RANGE	IN RANGE		INSPECTION READING °C		CHECK & LOG DAILY		CORRECT INCREMENT		ANNUAL THERMOMETER VERIFICATION				
		Y	N	DEQ	Site	Y	N	Y	N	Is the NIST/NIST Traceable Reference Thermometer within Manufacturer's expiration date or recertified yearly?		Yes\No		
												X		
										DATE CHECKED	MARKED		CORR FACTOR °C	INSPECTION TEMP °C
											Y	N		
SAMPLE REFRIGER.	1-6° C	X		2.3	2.3	X		X		4-15-08	X		0	4.0
AUTO SAMPLER	1-6° C	X		1.8	2.2	X		X		4-15-08	See comments		-0.8	4.0
REAGENT REFRIGER.	1-6° C													
pH METER	± 1° C	X				X		X		4-15-08	X		+0.8	24.0
DO METER	± 1° C	X		9.47	10.2	X		X		4-15-08	X		+0.4	24.0
SOLIDS DRYING OVEN	103-105° C	X		103	102	X				4-15-08	X		+0.2	105
OUTFALL THERMOMETER				NA		X				4-15-08	X		+0.1	16

COMMENTS:	<p>TSS oven not in use on the day of inspection</p> <p>The correction factor for the pH meter is rather large. If the correction factor exceeds 1 degree difference from the NIST traceable thermometer, and the ATC/probe or meter should be serviced or replaced as applicable.</p>
PROBLEMS:	<p>The label on the effluent composite sample had a correction factor listed of -.08, however the operator believed the correction factor was actually 0. (Paperwork provided shows the comparison on 4-15-08 correction factor of 0.8)Discussion between Allen and Jeff revealed that the initial test of the thermometer (4-15-08) did have a 0.8 correction factor; however, the comparison was redone a couple days later by Allen and the correction factor = 0 °C. They think the label was just not changed after the second NIST comparison. The label for the thermometer was corrected while we were on site.</p> <p>The plant inspection reading above reflects a correction factor of -0.8 °C as the thermometer was labeled at the time. The uncorrected temperature reading = 3.0°C.</p>

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
SAMPLE ANALYSIS HOLDING TIME/CONTAINER/PRESERVATION CHECK SHEET

Revised 3/08 [40 CFR, Part 136.3, Table II]

FACILITY NAME:		Town of Warrenton STP						VPDES NO:		VA0021172		DATE:		April 23, 2008	
HOLDING TIMES						SAMPLE CONTAINER				PRESERVATION					
PARAMETER	APPROVED	MET?		LOGGED?		ADEQ. VOLUME		APPROP. TYPE		APPROVED	MET?		CHECKED?		
		Y	N	Y	N	Y	N	Y	N		Y	N	Y	N	
BOD5 & CBOD5	48 HOURS	X		X		X		X		ANALYZE 2 HRS or 6°C	X		X		
TSS	7 DAYS	X		X		X		X		6°C	X		X		
FECAL COLIFORM / <i>E. coli</i> / <i>Enterococci</i>	6 HRS & 2 HRS TO PROCESS	X		X		X		X		10°C (1 HOUR)+ 0.008% Na ₂ S ₂ O ₃	X		X		
pH	15 MIN.	X		X		X		X		N/A					
DISSOLVED O ₂	15 MIN./IN SITU	X		X		X		X		N/A					
TEMPERATURE	IMMERSION STAB.	X		X		X		X		N/A					
AMMONIA	28 DAYS	X		X		X		X		6°C + H ₂ SO ₄ pH<2 DECHLOR	X		X		
TKN	28 DAYS	X								6°C + H ₂ SO ₄ pH<2 DECHLOR	X		X		
NITRATE	48 HOURS	X		X		X		X		6°C	X		X		
NITRATE+NITRITE	28 DAYS	X		X		X		XX		6°C + H ₂ SO ₄ pH<2	X		X		
NITRITE	48 HOURS	X		X		X		X		6°C	X				
PHOSPHATE, ORTHO	48 HOURS	X		X		X		X		FILTER, 6°C			X		
TOTAL PHOS.	28 DAYS	X		X		X		X		6°C+ H ₂ SO ₄ pH<2	X		X		
PROBLEMS: Review of the Chain of Custody forms for samples sent to ESS no not indicate that samples to be analyzed for the parameter of Orthophosphate (OP) have been filtered before shipment to the contracted laboratory.															

To: Joan Crowther
From: Jennifer Carlson

Date: December 27, 2010
Subject: Planning Statement for Town of Warrenton
Permit No: VA0021172

Discharge Type: Municipal
Discharge Flow: 2.5 MGD

Receiving Stream: Great Run, UT (Cemetery Run is not named on the topo maps)

Latitude / Longitude: 38° 43' 00" / 77° 48' 57"
Waterbody ID: E02/RA07

1. Is there monitoring data for the receiving stream?

There is no monitoring data for the unnamed tributary to Great Run.

- If yes, please attach latest summary.
- If no, where is the nearest downstream monitoring station.

The nearest downstream DEQ water quality monitoring station with ambient data is Station 3-GRT001.70, located on Great Run at the Rt. 687 bridge crossing, approximately 7.0 miles downstream from the outfall. This monitoring station is located on segment VAN-E02R_GRT01A00, which begins at the confluence with an unnamed tributary to Great Run, approximately 1.0 rivermiles upstream of Route 687, and continues downstream until the confluence with the Rappahannock River.

The following is the monitoring summary for Station 3-GRT001.70, as taken from the 2008 Integrated Assessment:

Class III, Section 4.

DEQ ambient and fish tissue/sediment monitoring station 3-GRT001.70, at Route 687.

E.coli monitoring finds a bacterial impairment, resulting in an impaired classification for the recreation use. A bacteria TMDL for the Great Run watershed has been completed and approved.

The aquatic life use is considered fully supporting with an observed effect, as the consensus based probable effects concentration (PEC) sediment screening values for nickel (48.6 ppm, dry weight) was exceeded in a sediment sample collected in 2006.

The wildlife and fish consumption uses are considered fully supporting.

Attachment 4

2. Is the receiving stream on the current 303(d) list?

The unnamed tributary to Great Run is not on the current 303(d) list.

- If yes, what is the impairment? N/A
- Has the TMDL been prepared? N/A
- If yes, what is the WLA for the discharge? N/A
- If no, what is the schedule for the TMDL? N/A

3. If the answer to (2) above is no, is there a downstream 303(d) listed impairment?

Yes. The unnamed tributary to Great Run flows into another unnamed tributary (3-XAC), which flows into Great Run, which in turns flows into the Rappahannock River.

- If yes, what is the impairment?

The following segments are listed as impaired for the recreational use:

1. **VAN-E02R_GRT03A02** – (begins at the confluence with an unnamed tributary to Great Run at rivermile 7.20, approximately 0.6 rivermile downstream from Route 802, and continues downstream until the confluence with another unnamed tributary, at approximately rivermile 5.5)

A downstream segment was previously listed for a fecal coliform bacteria impairment in 2004 and is currently listed for an E. coli bacteria impairment. The E. coli bacteria impairment was first listed in 2006.

2. **VAN-E02R_GRT02A04** – (begins at the confluence of an unnamed tributary to Great Run, at approximately rivermile 5.5, and continues downstream until the confluence with an unnamed tributary to Great Run, approximately 1.0 rivermile upstream of Route 687)

A downstream segment was previously listed for a fecal coliform bacteria impairment in 2004 and is currently listed for an E. coli bacteria impairment. The E. coli bacteria impairment was first listed in 2004.

3. **VAN-E02R_GRT01A00** – (begins at the confluence with an unnamed tributary to Great Run, approximately 1.0 rivermile upstream of Route 687, and continues downstream until the confluence with the Rappahannock River)

Sufficient excursions from the instantaneous E. coli bacteria criterion (7 of 27 samples - 25.9%) were recorded at DEQ's ambient water quality monitoring station (3-GRT001.70) at the Route 687 crossing to assess this stream segment as not supporting of the recreation use goal for the 2008 water quality assessment. The segment was previously listed for a fecal

coliform bacteria impairment for the 2004 assessment. The E. coli bacteria impairment was first listed in 2004.

4. **VAN-E02R_RPP01A02** – (begins at the confluence with Great Run, at rivermile 154.9, and continues downstream until the confluence with the Hazel River, at rivermile 147.52)

Sufficient excursions from the instantaneous E. coli bacteria criterion (6 of 16 samples - 37.5%) were recorded at DEQ's ambient water quality monitoring station (3-RPP150.32) at the Route 621 crossing to assess this stream segment as not supporting of the recreation use goal for the 2008 water quality assessment. The segment was previously listed for a fecal coliform bacteria impairment, as well, for the 2006 assessment. The E. coli bacteria impairment was first listed in 2006.

5. **VAN-E08R_RPP02A02** – (begins at the confluence with Ruffans Run and continues downstream until the confluence with Tinpot Run)

Sufficient excursions from the instantaneous E. coli bacteria criterion (7 of 36 samples - 19.4%) were recorded at DEQ's ambient water quality monitoring station (3-RPP147.10) at the Route 15/29 crossing to assess this stream segment as not supporting of the recreation use goal for the 2008 water quality assessment. The segment was previously listed for a fecal coliform bacteria impairment in 2004. The E. coli bacteria impairment was first listed in 2006.

6. **VAN-E08R_RPP01A02** – (begins at the confluence with an unnamed tributary to the Rappahannock River, at approximately rivermile 142.5, and continues downstream until the confluence with Marsh Run)

Sufficient excursions from the instantaneous E. coli bacteria criterion (4 of 22 samples - 18.2%) were recorded at DEQ's ambient water quality monitoring station (3-RPP142.36) at the Route 620 crossing to assess this stream segment as not supporting of the recreation use goal for the 2008 water quality assessment.

- Has a TMDL been prepared?

Yes, a bacteria TMDL for the Great Run watershed (segments VAN-E02R_GRT03A02, VAN-E02R_GRT02A04, VAN-E02R_GRT01A00) was submitted to the U.S. EPA and approved March 10, 2005. The SWCB approved the TMDL on December 20, 2005. The sources of bacteria requiring reductions are pet, livestock and wildlife waste delivered directly to the stream, and human contributions from straight pipes and failing septic systems.

Yes, the Upper Rappahannock River Watershed Bacteria TMDL (segments VAN-E08R_RPP02A02 and VAN-E08R_RPP01A02) was submitted to the U.S. EPA and approved January 23, 2008. The SWCB approved the TMDL on July 21, 2008.

- Will the TMDL include the receiving stream?

The TMDL did not specifically include the unnamed tributary to Great Run, but all upstream facilities were considered during TMDL development.

- Is there a WLA for the discharge?

Yes, the WLA for this facility is 4.35×10^{12} cfu/yr of *E. Coli* bacteria.

- What is the schedule for the TMDL?

The bacteria TMDL for the Great Run watershed was EPA approved on 03/10/05.

The bacteria TMDL for the Upper Rappahannock River Watershed was EPA approved on 01/23/08.

4. Is there monitoring or other conditions that Planning/Assessment needs in the permit?

The tidal Rappahannock River, which is located approximately 50 miles downstream of this facility, is listed with a PCB impairment. In support for the PCB TMDL that will be developed for the tidal Rappahannock River by 2016, this facility is a candidate for low-level PCB monitoring, based upon its designation as a major municipal facility. Low-level PCB analysis uses EPA Method 1668B, which is capable of detecting low-level concentrations for all 209 PCB congeners. The Assessment/TMDL Staff has concluded that low-level PCB monitoring is not warranted for this facility, as it is located in the headwaters of the Rappahannock River watershed and there are not any stream segments immediately downstream of the facility that are listed with a PCB impairment. Fish tissue monitoring has been conducted in Great Run and the non-tidal Rappahannock River, and there have been no exceedances of the fish tissue criterion for PCBs. Based upon this information, this facility will not be requested to monitor for low-level PCBs.

1999 Ammonia
Calculation

ATTACHMENT # 4 WARRENTON STP

Calculation for Total Ammonia values at different pH and Temperature than listed in the Water Quality Standards (VR680-21-01.14B)

pH = 7.4 standard units

Temperature = 21.1°C

THE ONE HOUR AVERAGE CONCENTRATION OF AMMONIA (IN MG/L AS UN-IONIZED NH₃) CAN BE CALCULATED BY USING THE FOLLOWING FORMULAS.

Acute criteria concentration = 0.52/FT/FPH/2

where: FT = Final Temperature

$$FT = 10^{0.03(20 - T)}; 0 < T < TCAP$$

TCAP = 25°C; when trout and other sensitive coldwater species are absent

$$FT = 10^{0.03(20 - 21.1)}$$

$$FT = 10^{0.03(-1.1)}$$

$$FT = 10^{-0.03} = 0.9268$$

Where: FPH = Final pH

$$FPH = (1 + 10^{7.4 - pH}) / 1.25; \quad 6.5 < pH < 8.0$$

$$FPH = (1 + 10^{7.4 - 7.4}) / 1.25 = 1.6$$

Therefore:

$$ACUTE CRITERIA CONCENTRATION = 0.52/0.9268/1.6/2 = 0.175$$

CONVERSION FROM UN-IONIZED TO TOTAL AMMONIA CAN BE CALCULATED BY USING THE FOLLOWING FORMULAS.

TOTAL AMMONIA CRITERIA = CALCULATED UN-IONIZED AMMONIA CRITERIA DIVIDED BY FACTION OF UN-IONIZED AMMONIA

Where: Fraction of un-ionized ammonia = $1/(10^{pKa-pH} + 1)$

where: $pKa = 0.09018 + (2729.92/(273.2 + \text{temperature } ^\circ\text{C}))$
 $pKa = 9.366$

$$\begin{aligned} \text{Fraction of un-ionized ammonia} &= 1/(10^{9.366 - 7.4} + 1) \\ &= 1/(10^{1.966} + 1) \\ &= 0.0106986 \end{aligned}$$

THEREFORE: TOTAL ACUTE AMMONIA CRITERIA = CALCULATED UN-IONIZED AMMONIA CRITERIA DIVIDED BY FRACTION OF UN-IONIZED AMMONIA

$$TOTAL ACUTE AMMONIA CRITERIA = 0.175/0.0106948 = 16.36 \text{ mg/l}$$

$$TOTAL AMMONIA-NITROGEN = 16.36 \times 0.824 = 13.48 \text{ mg/l NH}_3\text{-N}$$

THE 4-DAY AVERAGE CONCENTRATION OF AMMONIA (IN MG/L AS UN-IONIZED NH_3) CAN BE CALCULATED BY USING THE FOLLOWING FORMULA.

Chronic criteria concentration = $0.8/\text{FT}/\text{FPH}/\text{RATIO}$

where: FT = Final Temperature

$$\text{FT} = 10^{0.03(20 - \text{TCAP})}; \text{TCAP} < T < 30^\circ\text{C}$$

TCAP = 20°C ; when trout and other sensitive coldwater species are absent

$$\text{FT} = 10^{0.03(20 - 20)}$$

$$\text{FT} = 10^0 = 1$$

where: FPH = Final pH

$$\text{FPH} = (1 + 10^{7.4 - \text{pH}}) / 1.25; \quad 6.5 < \text{pH} < 8.0$$

$$\text{FPH} = (1 + 10^{7.4 - 7.4}) / 1.25 = 1.6$$

$$\text{RATIO} = 20.25 \times (10^{7.7 - \text{pH}} / (1 + 10^{7.4 - \text{pH}})); \quad 6.5 < \text{pH} < 7.7$$

$$\text{RATIO} = 20.25 \times (10^{7.7 - 7.4}) / (1 + 10^{7.4 - 7.4}) = 20.202$$

Therefore:

$$\text{CHRONIC CRITERIA CONCENTRATION} = 0.8/1/1.6/20.202 = 0.02475$$

CONVERSION FROM UN-IONIZED TO TOTAL AMMONIA CAN BE CALCULATED BY USING THE FOLLOWING FORMULAS.

TOTAL CHRONIC AMMONIA CRITERIA = CALCULATED UN-IONIZED AMMONIA CRITERIA DIVIDED BY FRACTION OF UN-IONIZED AMMONIA

Where: Fraction of un-ionized ammonia = $1/(10^{\text{pKa} - \text{pH}} + 1)$

where: $\text{pKa} = 0.09018 + (2729.92/(273.2 + \text{temperature } ^\circ\text{C}))$
 $\text{pKa} = 9.366$

$$\begin{aligned} \text{Fraction of un-ionized ammonia} &= 1/(10^{9.366 - 7.4} + 1) \\ &= 1/(10^{1.966} + 1) \\ &= 0.0106948 \end{aligned}$$

THEREFORE: TOTAL CHRONIC AMMONIA CRITERIA = CALCULATED UN-IONIZED AMMONIA CRITERIA DIVIDED BY FRACTION OF UN-IONIZED AMMONIA

$$\text{TOTAL CHRONIC AMMONIA CRITERIA} = 0.02475/0.0106948 = 2.32 \text{ mg/l}$$

$$\text{TOTAL AMMONIA-NITROGEN} = 2.32 \times 0.824 = 1.91 \text{ mg/l } \text{NH}_3\text{-N}$$

FRESHWATER WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Town of Warrenton WWTP(using 2010 permit reiss.data) Permit No.: VA0021172

Version: OWP Guidance Memo 00-2011 (8/24/00)

Receiving Stream: Great Run, UT

Stream Information

Mean Hardness (as CaCO₃) = 60 mg/L
 90% Temperature (Annual) = 21.1 deg C
 90% Temperature (Wet season) = 17 deg C
 90% Maximum pH = 7.4 SU
 10% Maximum pH = 6.6 SU
 Tier Designation (1 or 2) = 1
 Public Water Supply (PWS) Y/N? = n
 Trout Present Y/N? = n
 Early Life Stages Present Y/N? = y

Stream Flows

1Q10 (Annual) = 0.0109 MGD
 7Q10 (Annual) = 0.0129 MGD
 30Q10 (Annual) = 0.0246 MGD
 1Q10 (Wet season) = 0.1008 MGD
 30Q10 (Wet season) = 0.1758 MGD
 30Q5 = 0.0414 MGD
 Harmonic Mean = 0.1991 MGD

Mixing Information

Annual - 1Q10 Mix = 100 %
 - 7Q10 Mix = 100 %
 - 30Q10 Mix = 100 %
 Wet Season - 1Q10 Mix = 100 %
 - 30Q10 Mix = 100 %

Effluent Information

Mean Hardness (as CaCO₃) = 91.3 mg/L
 90% Temp (Annual) = 20 deg C
 90% Temp (Wet season) = deg C
 90% Maximum pH = 7.26 SU
 10% Maximum pH = 6.6 SU
 Discharge Flow = 2.5 MGD

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)
Acenaphthene	0	-	-	na	9.9E+02	-	-	na	1.0E+03	-	-	-	-	-	-	na
Acrolein	0	-	-	na	9.3E+00	-	-	na	9.5E+00	-	-	-	-	-	-	na
Acrylonitrile ^c	0	-	-	na	2.5E+00	-	-	na	2.7E+00	-	-	-	-	-	-	na
Aldrin ^c	0	3.0E+00	-	na	5.0E-04	3.0E+00	-	na	5.4E-04	-	-	-	-	3.0E+00	-	na
Ammonia-N (mg/l)	0	2.75E+01	3.65E+00	na	-	2.8E+01	3.7E+00	na	-	-	-	-	-	2.8E+01	3.7E+00	na
Ammonia-N (mg/l)	0	2.74E+01	5.18E+00	na	-	2.8E+01	5.5E+00	na	-	-	-	-	-	2.8E+01	5.5E+00	na
Anthrane	0	-	-	na	4.0E+04	-	-	na	4.1E+04	-	-	-	-	-	-	na
Antimony	0	-	-	na	6.4E+02	-	-	na	6.5E+02	-	-	-	-	-	-	na
Arsenic	0	3.4E+02	1.5E+02	na	-	3.4E+02	1.5E+02	na	-	-	-	-	-	3.4E+02	1.5E+02	na
Barium	0	-	-	na	-	-	-	na	-	-	-	-	-	-	-	na
Benzene ^c	0	-	-	na	5.1E+02	-	-	na	5.5E+02	-	-	-	-	-	-	na
Benzidine ^c	0	-	-	na	2.0E-03	-	-	na	2.2E-03	-	-	-	-	-	-	na
Benzo (a) anthracene ^c	0	-	-	na	1.8E-01	-	-	na	1.9E-01	-	-	-	-	-	-	na
Benzo (b) fluoranthene ^c	0	-	-	na	1.8E-01	-	-	na	1.9E-01	-	-	-	-	-	-	na
Benzo (k) fluoranthene ^c	0	-	-	na	1.8E-01	-	-	na	1.9E-01	-	-	-	-	-	-	na
Benzo (a) pyrene ^c	0	-	-	na	1.8E-01	-	-	na	1.9E-01	-	-	-	-	-	-	na
Bis(2-Chloroethyl) Ether ^c	0	-	-	na	5.3E+00	-	-	na	5.7E+00	-	-	-	-	-	-	na
Bis(2-Chloroisopropyl) Ether ^c	0	-	-	na	6.5E+04	-	-	na	6.6E+04	-	-	-	-	-	-	na
Bis(2-Ethylhexyl) Phthalate ^c	0	-	-	na	2.2E+01	-	-	na	2.4E+01	-	-	-	-	-	-	na
Bromoform ^c	0	-	-	na	1.4E+03	-	-	na	1.5E+03	-	-	-	-	-	-	na
Butylbenzylphthalate	0	-	-	na	1.9E+03	-	-	na	1.9E+03	-	-	-	-	-	-	na
Cadmium	0	3.5E+00	1.1E+00	na	-	3.5E+00	1.1E+00	na	-	-	-	-	-	3.5E+00	1.1E+00	na
Carbon Tetrachloride ^c	0	-	-	na	1.6E+01	-	-	na	1.7E+01	-	-	-	-	-	-	na
Chlordane ^c	0	2.4E+00	4.3E-03	na	8.1E-03	2.4E+00	4.3E-03	na	8.7E-03	-	-	-	-	2.4E+00	4.3E-03	na
Chloride	0	8.6E+05	2.3E+05	na	-	8.6E+05	2.3E+05	na	-	-	-	-	-	8.6E+05	2.3E+05	na
TRC	0	1.9E+01	1.1E+01	na	-	1.9E+01	1.1E+01	na	-	-	-	-	-	1.9E+01	1.1E+01	na
Chlorobenzene	0	-	-	na	1.6E+03	-	-	na	1.6E+03	-	-	-	-	-	-	na

Attachment 5

using 1999 - Shechem data
 and 2010 Effluent Temp and pH
 and effluent TSS hardness data.

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorobromomethane ^c	0	-	-	na	1.3E+02	-	-	na	1.4E+02	-	-	-	-	-	-	-	-	-	-	na	1.4E+02
Chloroform	0	-	-	na	1.1E+04	-	-	na	1.1E+04	-	-	-	-	-	-	-	-	-	-	na	1.1E+04
2-Chloronaphthalene	0	-	-	na	1.6E+03	-	-	na	1.6E+03	-	-	-	-	-	-	-	-	-	-	na	1.6E+03
2-Chlorophenol	0	-	-	na	1.5E+02	-	-	na	1.5E+02	-	-	-	-	-	-	-	-	-	-	na	1.5E+02
Chlorpyrifos	0	8.3E-02	4.1E-02	na	-	8.3E-02	4.1E-02	na	-	-	-	-	-	-	-	-	-	8.3E-02	4.1E-02	na	-
Chromium III	0	5.3E+02	6.9E+01	na	-	5.3E+02	6.9E+01	na	-	-	-	-	-	-	-	-	-	5.3E+02	6.9E+01	na	-
Chromium VI	0	1.6E+01	1.1E+01	na	-	1.6E+01	1.1E+01	na	-	-	-	-	-	-	-	-	-	1.6E+01	1.1E+01	na	-
Chromium, Total	0	-	-	1.0E+02	-	-	-	na	-	-	-	-	-	-	-	-	-	-	-	na	-
Chrysene ^c	0	-	-	na	1.8E-02	-	-	na	1.9E-02	-	-	-	-	-	-	-	-	-	-	na	1.9E-02
Copper	0	1.2E+01	8.3E+00	na	-	1.2E+01	8.3E+00	na	-	-	-	-	-	-	-	-	-	1.2E+01	8.3E+00	na	-
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	2.2E+01	5.2E+00	na	1.6E+04	-	-	-	-	-	-	-	-	2.2E+01	5.2E+00	na	1.6E+04
DDD ^c	0	-	-	na	3.1E-03	-	-	na	3.3E-03	-	-	-	-	-	-	-	-	-	-	na	3.3E-03
DDE ^c	0	-	-	na	2.2E-03	-	-	na	2.4E-03	-	-	-	-	-	-	-	-	-	-	na	2.4E-03
DDT ^c	0	1.1E+00	1.0E-03	na	2.2E-03	1.1E+00	1.0E-03	na	2.4E-03	-	-	-	-	-	-	-	-	1.1E+00	1.0E-03	na	2.4E-03
Demeton	0	-	1.0E-01	na	-	-	1.0E-01	na	-	-	-	-	-	-	-	-	-	-	1.0E-01	na	-
Diazinon	0	1.7E-01	1.7E-01	na	-	1.7E-01	1.7E-01	na	-	-	-	-	-	-	-	-	-	1.7E-01	1.7E-01	na	-
Dibenz(a,h)anthracene ^c	0	-	-	na	1.8E-01	-	-	na	1.9E-01	-	-	-	-	-	-	-	-	-	-	na	1.9E-01
1,2-Dichlorobenzene	0	-	-	na	1.3E+03	-	-	na	1.3E+03	-	-	-	-	-	-	-	-	-	-	na	1.3E+03
1,3-Dichlorobenzene	0	-	-	na	9.8E+02	-	-	na	9.8E+02	-	-	-	-	-	-	-	-	-	-	na	9.8E+02
1,4-Dichlorobenzene	0	-	-	na	1.9E+02	-	-	na	1.9E+02	-	-	-	-	-	-	-	-	-	-	na	1.9E+02
3,3-Dichlorobenzidine ^c	0	-	-	na	2.8E-01	-	-	na	3.0E-01	-	-	-	-	-	-	-	-	-	-	na	3.0E-01
Dichlorobromomethane ^c	0	-	-	na	1.7E+02	-	-	na	1.8E+02	-	-	-	-	-	-	-	-	-	-	na	1.8E+02
1,2-Dichloroethane ^c	0	-	-	na	3.7E+02	-	-	na	4.0E+02	-	-	-	-	-	-	-	-	-	-	na	4.0E+02
1,1-Dichloroethylene	0	-	-	na	7.1E+03	-	-	na	7.2E+03	-	-	-	-	-	-	-	-	-	-	na	7.2E+03
1,2-trans-dichloroethylene	0	-	-	na	1.0E+04	-	-	na	1.0E+04	-	-	-	-	-	-	-	-	-	-	na	1.0E+04
2,4-Dichlorophenol	0	-	-	na	2.9E+02	-	-	na	2.9E+02	-	-	-	-	-	-	-	-	-	-	na	2.9E+02
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	-	-	na	-	-	-	na	-	-	-	-	-	-	-	-	-	-	-	na	-
1,2-Dichloropropane ^c	0	-	-	na	1.5E+02	-	-	na	1.6E+02	-	-	-	-	-	-	-	-	-	-	na	1.6E+02
1,3-Dichloropropane ^c	0	-	-	na	2.1E+02	-	-	na	2.3E+02	-	-	-	-	-	-	-	-	-	-	na	2.3E+02
Dieldrin ^c	0	2.4E-01	5.6E-02	na	5.4E-04	2.4E-01	5.6E-02	na	5.8E-04	-	-	-	-	-	-	-	-	2.4E-01	5.6E-02	na	5.8E-04
Diethyl Phthalate	0	-	-	na	4.4E+04	-	-	na	4.5E+04	-	-	-	-	-	-	-	-	-	-	na	4.5E+04
2,4-Dimethylphenol	0	-	-	na	8.5E+02	-	-	na	8.6E+02	-	-	-	-	-	-	-	-	-	-	na	8.6E+02
Dimethyl Phthalate	0	-	-	na	1.1E+06	-	-	na	1.1E+06	-	-	-	-	-	-	-	-	-	-	na	1.1E+06
Di-n-Butyl Phthalate	0	-	-	na	4.5E+03	-	-	na	4.6E+03	-	-	-	-	-	-	-	-	-	-	na	4.6E+03
2,4 Dinitrophenol	0	-	-	na	5.3E+03	-	-	na	5.4E+03	-	-	-	-	-	-	-	-	-	-	na	5.4E+03
2-Methyl-4,6-Dinitrophenol	0	-	-	na	2.8E+02	-	-	na	2.8E+02	-	-	-	-	-	-	-	-	-	-	na	2.8E+02
2,4-Dinitrotoluene ^c	0	-	-	na	3.4E+01	-	-	na	3.7E+01	-	-	-	-	-	-	-	-	-	-	na	3.7E+01
Dioxin 2,3,7,8- tetrachlorodibenzo-p-dioxin	0	-	-	na	5.1E-08	-	-	na	5.2E-08	-	-	-	-	-	-	-	-	-	-	na	5.2E-08
1,2-Diphenylhydrazine ^c	0	-	-	na	2.0E+00	-	-	na	2.2E+00	-	-	-	-	-	-	-	-	-	-	na	2.2E+00
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	9.0E+01	-	-	-	-	-	-	-	-	2.2E-01	5.6E-02	na	9.0E+01
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	2.2E-01	5.6E-02	na	9.0E+01	-	-	-	-	-	-	-	-	2.2E-01	5.6E-02	na	9.0E+01
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	-	-	2.2E-01	5.6E-02	-	-	-	-	-	-	-	-	-	-	2.2E-01	5.6E-02	-	-
Endosulfan Sulfate	0	-	-	na	8.9E+01	-	-	na	9.0E+01	-	-	-	-	-	-	-	-	-	-	na	9.0E+01
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	8.6E-02	3.6E-02	na	6.1E-02	-	-	-	-	-	-	-	-	8.6E-02	3.6E-02	na	6.1E-02
Endrin Aldehyde	0	-	-	na	3.0E-01	-	-	na	3.0E-01	-	-	-	-	-	-	-	-	-	-	na	3.0E-01

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	-	-	na	2.1E+03	-	-	na	2.1E+03	-	-	-	-	-	-	-	na	-	-	na	2.1E+03
Fluoranthene	0	-	-	na	1.4E+02	-	-	na	1.4E+02	-	-	-	-	-	-	-	na	-	-	na	1.4E+02
Fluorene	0	-	-	na	5.3E+03	-	-	na	5.4E+03	-	-	-	-	-	-	-	na	-	-	na	5.4E+03
Foaming Agents	0	-	-	na	-	-	-	na	-	-	-	-	-	-	-	-	na	-	-	na	-
Guthion	0	-	1.0E-02	na	-	-	-	1.0E-02	-	-	-	-	-	-	-	-	1.0E-02	-	-	1.0E-02	-
Heptachlor ^c	0	5.2E-01	3.8E-03	na	7.9E-04	-	-	3.8E-03	8.5E-04	-	-	-	-	-	-	-	3.8E-03	-	-	3.8E-03	8.5E-04
Heptachlor Epoxide ^c	0	5.2E-01	3.8E-03	na	3.9E-04	-	-	3.8E-03	4.2E-04	-	-	-	-	-	-	-	3.8E-03	-	-	3.8E-03	4.2E-04
Hexachlorobenzene ^c	0	-	-	na	2.9E-03	-	-	-	3.1E-03	-	-	-	-	-	-	-	na	-	-	na	3.1E-03
Hexachlorobutadiene ^c	0	-	-	na	1.8E+02	-	-	na	1.9E+02	-	-	-	-	-	-	-	na	-	-	na	1.9E+02
Hexachlorocyclohexane	0	-	-	na	4.9E-02	-	-	na	5.3E-02	-	-	-	-	-	-	-	na	-	-	na	5.3E-02
Alpha-BHC ^c	0	-	-	na	1.7E-01	-	-	na	1.8E-01	-	-	-	-	-	-	-	na	-	-	na	1.8E-01
Hexachlorocyclohexane Beta BHC ^c	0	-	-	na	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Hexachlorocyclohexane Gamma-BHC ^c (Lindane)	0	9.5E-01	na	na	1.8E+00	-	-	-	1.9E+00	-	-	-	-	-	-	-	na	-	-	na	1.9E+00
Hexachlorocyclopentadiene	0	-	-	na	1.1E+03	-	-	-	1.1E+03	-	-	-	-	-	-	-	na	-	-	na	1.1E+03
Hexachloroethane ^c	0	-	-	na	3.3E+01	-	-	-	3.6E+01	-	-	-	-	-	-	-	na	-	-	na	3.6E+01
Hydrogen Sulfide	0	-	2.0E+00	na	-	-	-	2.0E+00	-	-	-	-	-	-	-	-	na	-	-	na	-
Indeno (1,2,3-cd) pyrene ^c	0	-	-	na	1.8E-01	-	-	-	1.9E-01	-	-	-	-	-	-	-	na	-	-	na	1.9E-01
Iron	0	-	-	na	-	-	-	na	-	-	-	-	-	-	-	-	na	-	-	na	-
Isophorone ^c	0	-	-	na	9.6E+03	-	-	-	1.0E+04	-	-	-	-	-	-	-	na	-	-	na	1.0E+04
Kepon	0	-	0.0E+00	na	-	-	-	0.0E+00	-	-	-	-	-	-	-	-	na	-	-	na	-
Lead	0	1.1E+02	1.2E+01	na	-	-	-	1.1E+02	1.2E+01	-	-	-	-	-	-	-	na	-	-	na	-
Malathion	0	-	1.0E-01	na	-	-	-	1.0E-01	-	-	-	-	-	-	-	-	na	-	-	na	-
Manganese	0	-	-	na	-	-	-	-	-	-	-	-	-	-	-	-	na	-	-	na	-
Mercury	0	1.4E+00	7.7E-01	-	-	-	-	1.4E+00	7.7E-01	-	-	-	-	-	-	-	na	-	-	na	-
Methyl Bromide	0	-	-	na	1.5E+03	-	-	-	1.5E+03	-	-	-	-	-	-	-	na	-	-	na	1.5E+03
Methylene Chloride ^c	0	-	-	na	5.9E+03	-	-	-	6.4E+03	-	-	-	-	-	-	-	na	-	-	na	6.4E+03
Methoxychlor	0	-	3.0E-02	na	-	-	-	3.0E-02	-	-	-	-	-	-	-	-	na	-	-	na	-
Mirex	0	-	0.0E+00	na	-	-	-	0.0E+00	-	-	-	-	-	-	-	-	na	-	-	na	-
Nickel	0	1.7E+02	1.9E+01	na	4.6E+03	-	-	1.7E+02	1.9E+01	-	-	-	-	-	-	-	na	-	-	na	-
Nitrate (as N)	0	-	-	na	-	-	-	-	-	-	-	-	-	-	-	-	na	-	-	na	-
Nitrobenzene	0	-	-	na	6.9E+02	-	-	-	7.0E+02	-	-	-	-	-	-	-	na	-	-	na	7.0E+02
N-Nitrosodimethylamine ^c	0	-	-	na	3.0E+01	-	-	-	3.2E+01	-	-	-	-	-	-	-	na	-	-	na	3.2E+01
N-Nitrosodiphenylamine ^c	0	-	-	na	6.0E+01	-	-	-	6.5E+01	-	-	-	-	-	-	-	na	-	-	na	6.5E+01
N-Nitrosodi-n-propylamine ^c	0	-	-	na	5.1E+00	-	-	-	5.5E+00	-	-	-	-	-	-	-	na	-	-	na	5.5E+00
Nonylphenol	0	2.8E+01	6.8E+00	-	-	-	-	2.8E+01	6.8E+00	-	-	-	-	-	-	-	na	-	-	na	-
Parathion	0	6.5E-02	1.3E-02	na	-	-	-	6.5E-02	1.3E-02	-	-	-	-	-	-	-	na	-	-	na	-
PCB Total ^c	0	-	1.4E-02	na	6.4E-04	-	-	-	1.4E-02	-	-	-	-	-	-	-	na	-	-	na	-
Pentachlorophenol ^c	0	5.8E+00	4.5E+00	na	3.0E+01	-	-	5.8E+00	4.5E+00	-	-	-	-	-	-	-	na	-	-	na	-
Phenol	0	-	-	na	8.6E+05	-	-	-	8.7E+05	-	-	-	-	-	-	-	na	-	-	na	8.7E+05
Pyrene	0	-	-	na	4.0E+03	-	-	-	4.1E+03	-	-	-	-	-	-	-	na	-	-	na	4.1E+03
Radionuclides	0	-	-	na	-	-	-	-	-	-	-	-	-	-	-	-	na	-	-	na	-
Gross Alpha Activity (pCi/L)	0	-	-	na	-	-	-	-	-	-	-	-	-	-	-	-	na	-	-	na	-
Beta and Photon Activity (mrem/yr)	0	-	-	na	4.0E+00	-	-	-	4.1E+00	-	-	-	-	-	-	-	na	-	-	na	4.1E+00
Radium 226 + 228 (pCi/L)	0	-	-	na	-	-	-	-	-	-	-	-	-	-	-	-	na	-	-	na	-
Uranium (ug/l)	0	-	-	na	-	-	-	-	-	-	-	-	-	-	-	-	na	-	-	na	-

Parameter (ug/l unless noted)	Background Conc.	Water Quality Criteria			Wasteload Allocations			Antidegradation Baseline			Antidegradation Allocations			Most Limiting Allocations		
		Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	2.0E+01	5.0E+00	na	4.3E+03	--	--	--	--	2.0E+01	5.0E+00	na
Silver	0	2.9E+00	--	na	--	3.0E+00	--	na	--	--	--	--	--	3.0E+00	--	na
Sulfate	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na
1,1,2,2-Tetrachloroethane ^c	0	--	--	na	4.0E+01	--	--	na	4.3E+01	--	--	--	--	--	--	na
Tetrachloroethylene ^c	0	--	--	na	3.3E+01	--	--	na	3.6E+01	--	--	--	--	--	--	na
Thallium	0	--	--	na	4.7E-01	--	--	na	4.8E-01	--	--	--	--	--	--	na
Toluene	0	--	--	na	6.0E+03	--	--	na	6.1E+03	--	--	--	--	--	--	na
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na
Toxaphene ^c	0	7.3E-01	2.0E-04	na	2.8E-03	7.3E-01	2.0E-04	na	3.0E-03	--	--	--	--	7.3E-01	2.0E-04	na
Tributyltin	0	4.6E-01	7.2E-02	na	--	4.6E-01	7.2E-02	na	--	--	--	--	--	4.6E-01	7.2E-02	na
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	7.1E+01	--	--	--	--	--	--	na
1,1,2-Trichloroethane ^c	0	--	--	na	1.6E+02	--	--	na	1.7E+02	--	--	--	--	--	--	na
Trichloroethylene ^c	0	--	--	na	3.0E+02	--	--	na	3.2E+02	--	--	--	--	--	--	na
2,4,6-Trichlorophenol ^c	0	--	--	na	2.4E+01	--	--	na	2.6E+01	--	--	--	--	--	--	na
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na
Vinyl Chloride ^c	0	--	--	na	--	--	--	na	--	--	--	--	--	--	--	na
Zinc	0	1.1E+02	1.1E+02	na	2.6E+04	1.1E+02	1.1E+02	na	2.6E+04	--	--	--	--	1.1E+02	1.1E+02	na

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
Antidegradation WLAs are based upon a complete mix.
Antidegrad. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
= (0.1(WQC - background conc.) + background conc.) for human health
6. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	6.5E+02
Arsenic	9.0E+01
Barium	na
Cadmium	6.4E-01
Chromium III	4.1E+01
Chromium VI	6.4E+00
Copper	4.9E+00
Iron	na
Lead	7.2E+00
Manganese	na
Mercury	4.6E-01
Nickel	1.1E+01
Selenium	3.0E+00
Silver	1.2E+00
Zinc	4.4E+01

Note: do not use QL's lower than the minimum QL's provided in agency guidance

2.500 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MG)				2.500	
Stream Flows		Total Mix Flows			
Allocated to Mix (MGD)		Stream + Discharge (MGD)			
Dry Season	Wet Season	Dry Season	Wet Season		
1Q10	0.011	0.101	2.511	2.601	
7Q10	0.013	N/A	2.513	N/A	
30Q10	0.025	0.176	2.525	2.676	
30Q5	0.041	N/A	2.541	N/A	
Harm. Mean	0.199	N/A	2.699	N/A	
Annual Avg.	0.000	N/A	2.500	N/A	
Stream/Discharge Mix Values					
Dry Season			Wet Season		
1Q10 90th% Temp. Mix (deg C)	20.005		0.659		
30Q10 90th% Temp. Mix (deg C)	20.011		1.117		
1Q10 90th% pH Mix (SU)	7.261		7.265		
30Q10 90th% pH Mix (SU)	7.261		7.268		
1Q10 10th% pH Mix (SU)	6.600		N/A		
7Q10 10th% pH Mix (SU)	6.600		N/A		
Calculated			Formula Inputs		
1Q10 Hardness (mg/L as CaCO3)	91.2		91.2		
7Q10 Hardness (mg/L as CaCO3)	91.1		91.1		

Ammonia - Dry Season - Acute		Ammonia - Dry Season - Chronic	
90th Percentile pH (SU)	7.261	90th Percentile Temp. (deg C)	20.011
(7.204 - pH)	-0.057	90th Percentile pH (SU)	7.261
(pH - 7.204)	0.057	MIN	2.000
		MAX	20.011
Trout Present Criterion (mg N/L)	18.379	(7.688 - pH)	0.427
Trout Absent Criterion (mg N/L)	27.521	(pH - 7.688)	-0.427
Trout Present?	n	Early LS Present Criterion (mg N)	3.651
Effective Criterion (mg N/L)	27.521	Early LS Absent Criterion (mg N)	3.651
		Early Life Stages Present?	y
		Effective Criterion (mg N/L)	3.651

Ammonia - Wet Season - Acute		Ammonia - Wet Season - Chronic	
90th Percentile pH (SU)	7.265	90th Percentile Temp. (deg C)	1.117
(7.204 - pH)	-0.061	90th Percentile pH (SU)	7.268
(pH - 7.204)	0.061	MIN	2.850
		MAX	7.000
Trout Present Criterion (mg N/L)	18.287	(7.688 - pH)	0.420
Trout Absent Criterion (mg N/L)	27.384	(pH - 7.688)	-0.420
Trout Present?	n	Early LS Present Criterion (mg N)	5.181
Effective Criterion (mg N/L)	27.384	Early LS Absent Criterion (mg N)	8.413
		Early Life Stages Present?	y
		Effective Criterion (mg N/L)	5.181

2.500 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGI)				2.500	
100% Stream Flows		Total Mix Flows			
Allocated to Mix (MGD)		Stream + Discharge (MGD)			
Dry Season	Wet Season	Dry Season	Wet Season		
1Q10	0.011	0.101	2.601		
7Q10	0.013	N/A	N/A		
30Q10	0.025	0.176	2.676		
30Q5	0.041	N/A	N/A		
Harm. Mean	0.199	N/A	2.699		
Annual Avg.	0.000	N/A	2.500		
Stream/Discharge Mix Values					
	Dry Season	Wet Season			
1Q10 90th% Temp. Mix (deg C)	20.005	0.659			
30Q10 90th% Temp. Mix (deg C)	20.011	1.117			
1Q10 90th% pH Mix (SU)	7.261	7.265			
30Q10 90th% pH Mix (SU)	7.261	7.268			
1Q10 10th% pH Mix (SU)	6.600	N/A			
7Q10 10th% pH Mix (SU)	6.600	N/A			
			Calculated	Formula Inputs	
1Q10 Hardness (mg/L as CaCO3) =	91.164	91.164			
7Q10 Hardness (mg/L as CaCO3) =	91.139	91.139			

Ammonia - Dry Season - Acute		Ammonia - Dry Season - Chronic	
90th Percentile pH (SU)	7.261	90th Percentile Temp. (deg C)	20.011
(7.204 - pH)	-0.057	90th Percentile pH (SU)	7.261
(pH - 7.204)	0.057	MIN	2.000
		MAX	20.011
Trout Present Criterion (mg N/L)	18.379	(7.688 - pH)	0.427
Trout Absent Criterion (mg N/L)	27.521	(pH - 7.688)	-0.427
Trout Present?	n	Early LS Present Criterion (mg N)	3.651
Effective Criterion (mg N/L)	27.521	Early LS Absent Criterion (mg N)	3.651
		Early Life Stages Present?	y
		Effective Criterion (mg N/L)	3.651

Ammonia - Wet Season - Acute		Ammonia - Wet Season - Chronic	
90th Percentile pH (SU)	7.265	90th Percentile Temp. (deg C)	1.117
(7.204 - pH)	-0.061	90th Percentile pH (SU)	7.268
(pH - 7.204)	0.061	MIN	2.850
		MAX	7.000
Trout Present Criterion (mg N/L)	18.287	(7.688 - pH)	0.420
Trout Absent Criterion (mg N/L)	27.384	(pH - 7.688)	-0.420
Trout Present?	n	Early LS Present Criterion (mg N)	5.181
Effective Criterion (mg N/L)	27.384	Early LS Absent Criterion (mg N)	8.413
		Early Life Stages Present?	y
		Effective Criterion (mg N/L)	5.181

Temperature and pH Stream Data Collected at 3-GRT001.70
January 1999 - November 2007

Collection Date	Field pH	Temperature
1/28/1999	7.2	5.7
3/22/1999	7.3	7.3
5/26/1999	6.9	17.1
8/26/1999	7.6	23.1
12/13/1999	6	5.2
4/25/2000	--	13
8/16/2000	6.47	23.09
10/5/2000	7.23	17.86
2/13/2001	--	--
3/28/2001	7.25	4.55
5/15/2001	7.6	14.54
5/15/2001	7.6	14.54
5/15/2001	7.6	14.54
5/15/2001	7.6	14.54
5/15/2001	7.6	14.54
5/15/2001	7.6	14.54
7/22/2003	7.32	22.89
9/30/2003	6.89	13.91
7/19/2004	7.3	21.17
9/27/2004	7.47	18.11
11/22/2004	7.88	12.69
2/16/2005	7.3	6.98
3/29/2005	6.89	9.11
4/25/2005	7.23	9.87
6/1/2005	7.07	16.68
1/24/2006	7.22	5.17
3/30/2006	8	10.7
5/9/2006	7.1	13.5
6/6/2006	7.1	18.2
7/11/2006	6.8	21.9
1/30/2007	--	4
3/28/2007	7.5	13.6
5/31/2007	7.2	20.8
7/17/2007	7	21.6
9/24/2007	7.5	16.5
11/26/2007	6.8	6.9

7.6 90th percentile pH

21.557 90th percentile Temperature

6.827 10th percentile pH

Hardness Stream Data Collected at 3-GRT001.70
January 1999 - May 2001

Collection Date	Hardness mg/L
1/28/1999	58
3/22/1999	72
5/26/1999	60
8/26/1999	89.2
12/13/1999	60.3
4/25/2000	50
8/16/2000	35.4
10/5/2000	65.9
2/13/2001	56.2
3/28/2001	43.2
5/15/2001	68.6
Average	59.9

Define Point of Interest

38,42,59.9 -77,48,56.9

is the Search Point

Submit

Cancel

Search Point

- ☒ Change to "clicked" map point
- ☐ Fixed at 38,42,59.9 - 77,48,56.9

Show Position Rings

- ☒ Yes ☐ No

1 mile and 1/4 mile at the Search Point

Show Search Area

- ☒ Yes ☐ No

2 miles

Search Point is at map center

Base Map Choices

Topography

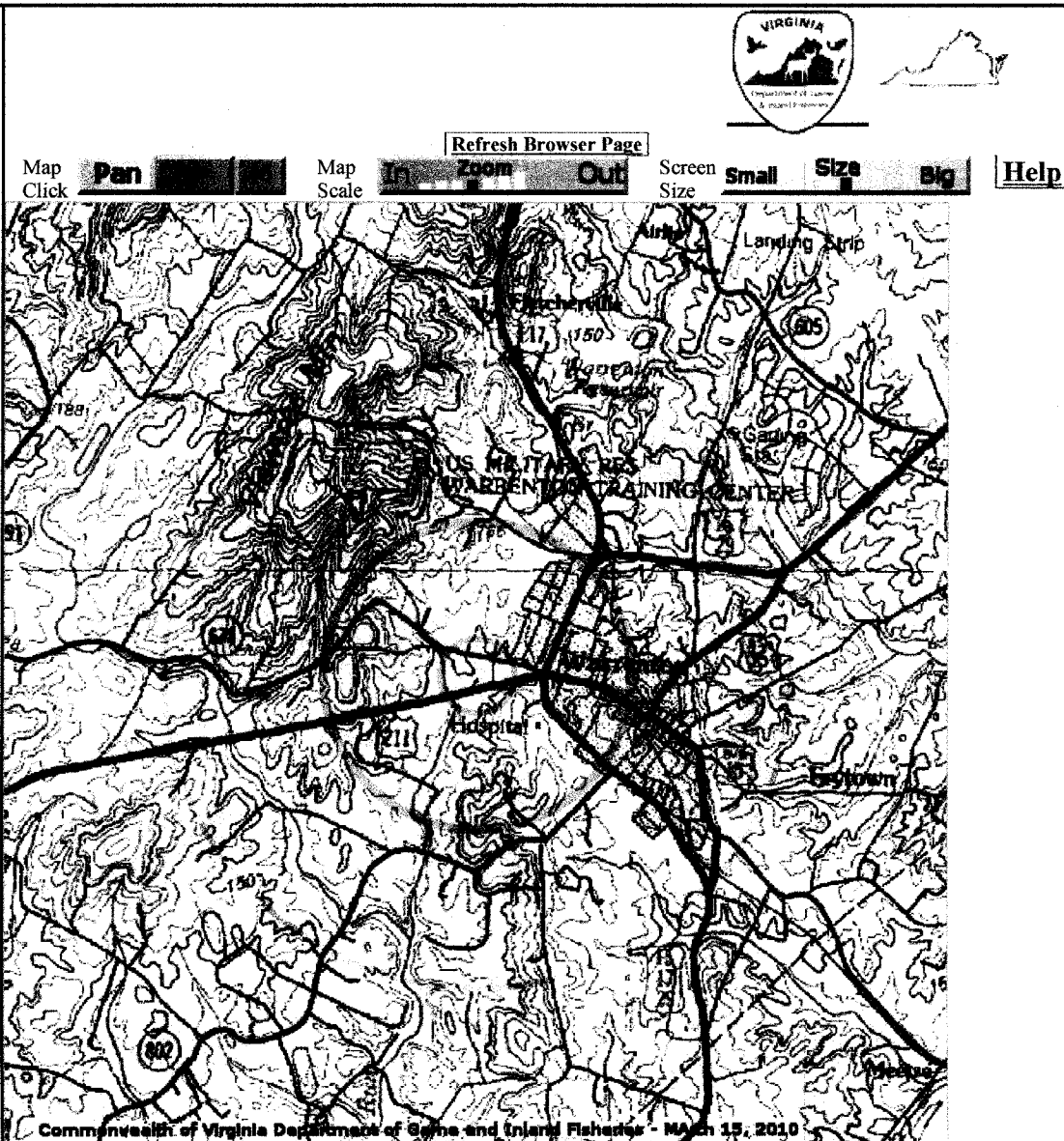
Map Overlay Choices

Current List: Position, Search

Map Overlay Legend

Position Rings
1 mile and 1/4 mile at the Search Point

2 mile radius Search Area



Point of Search 38,42,59.9 -77,48,56.9

Map Location 38,42,59.9 -77,48,56.9

Select Coordinate System: ☒ Degrees, Minutes, Seconds Latitude - Longitude

☐ Decimal Degrees Latitude - Longitude

☐ Meters UTM NAD83 East North Zone

☐ Meters UTM NAD27 East North Zone

Base Map source: USGS 1:100,000 topographic maps (see terraser-ver-usa.com for details)

Map projection is UTM Zone 18 NAD 1983 with left 250393 and top 4293911. Pixel size is 16 meters. Coordinates displayed are Degrees, Minutes, Seconds North and West. Map is currently displayed as 600 columns by 600 rows for a total of 360000 pixels. The map display represents 9600 meters east to west by 9600 meters north to south for a total of 92.1 square kilometers. The map display represents 31501 feet east to west by 31501 feet north to south for a total of 35.5 square miles.

Black and white aerial photography acquired near 1990 and topographic maps are from the United States

Attachment
8

Department of the Interior, United States Geological Survey.
Shaded topographic maps are from TOPO! ©2006 National Geographic
<http://www.nationalgeographic.com/topo>
Color aerial photography acquired 2002 is from Virginia Base Mapping Program, Virginia Geographic Information Network
All other map products are from the Commonwealth of Virginia Department of Game and Inland Fisheries.
map assembled 2010-03-15 13:55:15 (qa/qc July 27, 2009 10:09 - tn=282201 dist=3218 I)

| [DGIF](#) | [Credits](#) | [Disclaimer](#) | Contact shirl.dressler@dgif.virginia.gov | Please view our [privacy policy](#) |
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Virginia Department of Game and Inland Fisheries

3/15/2010 1:56:43 PM

Fish and Wildlife Information Service

VaFWIS Initial Project Assessment Report Compiled on
3/15/2010, 1:56:43 PM

[Help](#)

Known or likely to occur within a 2 mile radius of 38,42,59.8 -77,48,56.8
in 061 Fauquier County, VA

420 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 27) (27 species with Status* or Tier I**)

<u>BOVA Code</u>	<u>Status*</u>	<u>Tier**</u>	<u>Common Name</u>	<u>Scientific Name</u>	<u>Confirmed</u>	<u>Database(s)</u>
060003	FESE	II	<u>Wedgemussel, dwarf</u>	Alasmidonta heterodon		BOVA
040129	ST	I	<u>Sandpiper, upland</u>	Bartramia longicauda		BOVA
040293	ST	I	<u>Shrike, loggerhead</u>	Lanius ludovicianus		BOVA
040379	ST	I	<u>Sparrow, Henslow's</u>	Ammodramus henslowii		BOVA
040093	FSST	II	<u>Eagle, bald</u>	Haliaeetus leucocephalus		BOVA
040292	ST		<u>Shrike, migrant loggerhead</u>	Lanius ludovicianus migrans		BOVA
100248	FS	I	<u>Fritillary, regal</u>	Speyeria idalia idalia		BOVA
060029	FSSS	III	<u>Lance, yellow</u>	Elliptio lanceolata		BOVA
040306	SS	I	<u>Warbler, golden-winged</u>	Vermivora chrysoptera		BOVA
040266	SS	II	<u>Wren, winter</u>	Troglodytes troglodytes		BOVA
030063	CC	III	<u>Turtle, spotted</u>	Clemmys guttata		BOVA
040094	SS	III	<u>Harrier, northern</u>	Circus cyaneus		BOVA
040204	SS	III	<u>Owl, barn</u>	Tyto alba pratincola	<u>Yes</u>	Collections,BBA,BOVA
030012	CC	IV	<u>Rattlesnake, timber</u>	Crotalus horridus		BOVA
040264	SS	IV	<u>Creeper, brown</u>	Certhia americana		BOVA
040364	SS		<u>Dickcissel</u>	Spiza americana		BOVA
040032	SS		<u>Egret, great</u>	Ardea alba egretta		BOVA
040366	SS		<u>Finch, purple</u>	Carpodacus purpureus		BOVA

040285	SS		<u>Kinglet, golden-crowned</u>	Regulus satrapa		BOVA
040112	SS		<u>Moorhen, common</u>	Gallinula chloropus cachinnans		BOVA
040262	SS		<u>Nuthatch, red-breasted</u>	Sitta canadensis		BOVA
040189	SS		<u>Tern, Caspian</u>	Sterna caspia		BOVA
040278	SS		<u>Thrush, hermit</u>	Catharus guttatus		BOVA
040314	SS		<u>Warbler, magnolia</u>	Dendroica magnolia		BOVA
050045	SS		<u>Otter, northern river</u>	Lontra canadensis lataxina		BOVA
040225		I	<u>Sapsucker, yellow-bellied</u>	Sphyrapicus varius		BOVA
040319		I	<u>Warbler, black-throated green</u>	Dendroica virens		BOVA

To view **All 420 species** [View 420](#)

* FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed; FC=Federal Candidate; FS=Federal Species of Concern; SC=State Candidate; CC=Collection Concern; SS=State Special Concern

** I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need; III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need

Anadromous Fish Use Streams

N/A

Colonial Water Bird Survey

N/A

Threatened and Endangered Waters

N/A

Cold Water Stream Survey (Trout Streams) Managed Trout Species

N/A

Public Holdings: (1 names)

Name	Agency	Level
Warrenton Military Training Reservation	Department of the Defense	Federal

audit no. 282201 3/15/2010 1:56:43 PM Virginia Fish and Wildlife Information Service

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Mixing Zone Predictions for

Town of Warrenton WWTP

Effluent Flow = 2.5 MGD
Stream 7Q10 = .012926 MGD
Stream 30Q10 = .0245594 MGD
Stream 1Q10 = .0109871 MGD
Stream slope = .0008 ft/ft
Stream width = 10 ft
Bottom scale = 2
Channel scale = 2

Mixing Zone Predictions @ 7Q10

Depth = .8901 ft
Length = 86.47 ft
Velocity = .437 ft/sec
Residence Time = .0023 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .8927 ft
Length = 86.23 ft
Velocity = .4377 ft/sec
Residence Time = .0023 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .8897 ft
Length = 86.5 ft
Velocity = .4369 ft/sec
Residence Time = .055 hours

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 1Q10 may be used.

Virginia DEQ Mixing Zone Analysis Version 2.1

Analysis of the Warrenton STP effluent data for Ammonia

1997 Ammonia
Calculation
monthly
average

The statistics for Ammonia are:

Number of values	=	1
Quantification level	=	.1
Number < quantification	=	0
Expected value	=	10
Variance	=	36.00001
C.V.	=	.6
97th percentile	=	24.33418
Statistics used	=	Reasonable potential assumptions - Type 2 data

The WLAs for Ammonia are:

Acute WLA	=	13.48
Chronic WLA	=	1.91
Human Health WLA	=	----

The limits are based on chronic toxicity and 30 samples/month.

Maximum daily limit	=	2.793518
Average monthly limit	=	1.384527 - 1.4 mg/L

It is recommended that only the maximum daily limit be used.

DATA

10

Analysis of the Warrenton(Weekly Average) effluent data for Ammonia

The statistics for Ammonia are:

Number of values	=	1
Quantification level	=	.1
Number < quantification	=	0
Expected value	=	10
Variance	=	36.00001
C.V.	=	.6
97th percentile	=	24.33418
Statistics used	=	Reasonable potential assumptions - Type 2 data

The WLAs for Ammonia are:

Acute WLA	=	13.48
Chronic WLA	=	1.91
Human Health WLA	=	----

The limits are based on chronic toxicity and (7) samples/month.

Maximum daily limit	=	2.793518
Average monthly ^{WEEKLY} limit	=	1.706022 - 1.7 mg/L

It is recommended that only the maximum daily limit be used.

DATA

10/12/2010 10:40:08 AM

Facility = Town of Warrenton using 2010 data. Data is expressed in mg/L.

Chemical = ammonia
Chronic averaging period = 30
WLAa = 28
WLAc = 3.7
Q.L. = .2
samples/mo. = 16
samples/wk. = 4

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average = 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Chronic Toxicity
Maximum Daily Limit = 7.46537934564035
Average Weekly limit = 5.10427188205143
Average Monthly Limit = 3.93345409406923

The data are:

MEMORANDUM

State Water Control Board

2111 North Hamilton Street

P. O. Box 11143

Richmond, VA. 23230

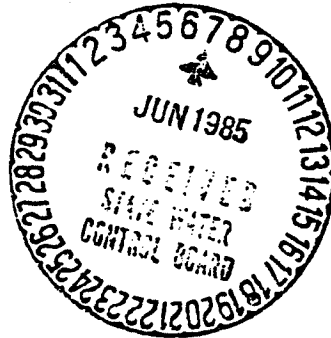
SUBJECT: Town of Warrenton

TO: Dale Phillips - OERS

FROM: Gary Moore *Gary*

DATE: June 5, 1985

COPIES:



The Town of Warrenton is studying the possibility of expanding its waste-water treatment plant. As part of this study, the Town's consulting engineers have asked that we establish effluent limits for plant flows of 1.5, 2.0 and 2.5 mgd at the existing discharge point (X-trib to Great Run), as well as a discharge at the point where the trib enters Great Run (1.8 miles downstream).

My basic assumptions and model runs are listed on the following pages. As you can see, the first run at 1.5 mgd took the most time to arrive at limits which are acceptable. Since the treatment plant flows constitute 95% or more of the stream flows, these models are flow-independent and the same limits were produced for all STP flows at both discharge points. These limits are: $BOD_5 = 10$ mg/l, $TKN = 5$ mg/l, $D.O. = 6.5$ mg/l.

I ran the standard coefficient sensitivity runs for each flow, and without exception, the limits listed above meet three of the four tests. The minimum D.O. for the most stringent test is 4.7 mg/l. I believe these limits are appropriate for the following reasons:

1. Three of the four sensitivity tests are passed, thus providing an acceptable degree of risk that WQS will not be violated.
2. The most severe test produced a minimum D.O. of 4.7 mg/l. In order to raise this minimum D.O. to 5.0 mg/l, the BOD_5 would have to be in the range which requires carbon columns. In my opinion, desk-top technology does not justify this additional expenditure in order to achieve a very small increase in stream D.O.
3. The existing plant has a design flow rating of 1.0 mgd, and a BOD_5 limit of 18 mg/l. Our recent grab sample and survey results show TKN concentrations of generally 8-10 mg/l. The proposed limits would reduce concentrations for both of these parameters.

I would appreciate your comments on the acceptability of my rationale, as stated above. Please call should questions arise, and as always, thanks for your help.

/cpm

OK MOP
7-16-85

Attachment 11

Warrenton STP

5/23/85

1. Distance from STP to confluence of X-trib + Great Run = 1.8 mi
 2. Distance from 1. to Rt 687 bridge = 5.1 mi
 3. Slope from STP to Rt 687 bridge = $\frac{480 - 320}{6.9 \text{ mi}} = \frac{23 \text{ ft}}{\text{mi}} = 0.0044 \frac{\text{ft}}{\text{ft}}$
 4. 7Q/10 X trib at Great Run = 0.026 mgd (3.73 cfs mi)
 5. 7Q/10 for Great Run at confluence w X-trib = 0.093 mgd (13.65 cfs)
 6. DA from (5) to Rt 687 bridge: 6.8 cfs mi (0.046 mgd)
 7. assume stream velocity of 0.25 fps
 t from STP to confluence of X-trib + Great Run = 0.44 day
 t from confluence to Rt 687 bridge = 1.25 day
 8. Use $K_m = 0.3$
 9. $BOD_u = BOD_5 \times 2.5$, $NOD_u = TRN \times 4.33$
 10. $D_{O_{sat}} = 7.6 \text{ mg/l}$
- Models will be run for Q_{STP} of 1.5 mgd, 2.0 mgd, 2.5 mgd at existing outfall to X-trib + at confluence of X-trib + Great Run. NOD and sensitivity testing will be included.

K_2 Calculations:

$$\begin{aligned} \text{Churchill } K_2 &= 11.574 \cdot H^{.969} \cdot N^{-1.673} = 9.6 \\ \text{O'Connor } K_2 &= 12.274 \cdot H^{.5} \cdot N^{-1.5} = 17 \\ \text{Twigg } K_2 &= 4235.36 \cdot US = 4.7 \\ K_2 &= 0.025 \left(\frac{A/H}{L} \right) 24 = 14 \end{aligned} \quad \left. \begin{array}{l} \text{Average of these 4} \\ \text{values} = 11 \\ \text{At } 30^\circ\text{C, } K_2 = 14 \end{array} \right\}$$

Run model at existing point of discharge:

For $Q_{\text{STO}} = 1.5 \text{ m}^3/\text{s}$

① ~~use~~ Try $BOD_5 = 30$, $TKN = 20$, $DO = 6$, $K_1 = .215$, $\alpha = .34$

Mass balances:

$$BOD_u = \frac{(175 \times 1.5) + (3 \times 0.026)}{1.5 + 0.026} = \frac{112.5 + 0.078}{1.526} = 74$$

$$NOD_u = \frac{(87 \times 1.5) + (1.5 \times 0.026)}{1.526} = 86$$

$$DO = \frac{(6 \times 1.5) + (6.5 \times 0.026)}{1.526} = 6.0$$

At end of X-Turb ($t = .442$), $DO = 4.3$. Too low

② Try $BOD_5 = 30$, $TKN = 15$

$$\text{Mass balance: } NOD_u = \frac{(65 \times 1.5) + (1.5 \times 0.026)}{1.526} = 64$$

At $t = .4$, $DO = 4.7$ Too low

③ Try $BOD_5 = 20$, $TKN = 15$

Mass balance

$$BOD_u = \frac{(50 \times 1.5) + (34 \times 0.026)}{1.526} = 49$$

at $T = 0.4$, $DO = 5.3$, say DO is 5.2 at $t = 0.2$.

OK, so far

Mass balances with Good Run:

$$\text{BoD}_4 = \frac{(1.526 \times 42) + (0.093 \times 3)}{1.526 + 0.093} = \frac{\quad}{1.619} = \underline{40}$$

$$\text{NOB}_4 = \frac{(1.526 \times 56) + (0.093 \times 5)}{1.619} = 53$$

$$\text{DO} = \frac{(1.526 \times 5.3) + (0.093 \times 6.5)}{1.619} = 5.37 \quad \text{D}_a = 7.6 - 5.37 = 2.23$$

Sag is 5.5 at $t = 0.1$; ~~at~~

Sensitivity Analysis

- | | | |
|-----------------------------------|---------|-------|
| 1) double K_1 , min DO strength | $= 4.2$ | } No. |
| 2) double K_n , " " " | $= 4.1$ | |
| 3) $K_2/2$, " " " | $= 3.1$ | |
| 4) double K_1 & K_n , $K_2/2$ | $= 0$ | |

④ Try $\text{BoD}_5 = 15$, $\text{TRN} = 10$, $\text{DO} = 6.5$

Mass balances

$$\text{BoD}_4 : \frac{(38 \times 1.5) + (3 \times 0.26)}{1.526} = 37$$

$$\text{NOB}_4 = \frac{(43 \times 1.5) + (1.5 \times 0.26)}{1.526} = 42$$

$K_1 = .17 @ 20, .27 @ 30.$

$$\text{D}_a = 1.1$$

Mass bal w Good fun

$$BOD_u = \frac{(1.526 \times 33) + (.093 \times 7)}{1.619} = 31$$

$$NOD_u = \frac{(1.526 \times 37) + (.093 \times 5)}{1.619} = 35$$

$$D_0 = \frac{(1.526 \times 6.1) + (.093 \times 6.5)}{1.619} = 6.1 \quad D_2 = 1.5$$

At $t = 0.1$, D_0 is 6.2. Sag is at max.

Sensitivity

- 1) double K_1 , min $D_0 = 5.8$
- 2) double K_m , min $D_0 = ~~5.7~~ 5.7$
- 3) $K_2/2$, min $D_0 = ~~5.2~~ 5.2$
- 4) double $K_1, K_m, K_2/2$, min $D_0 = 3.2$ Too Low.

⑤ Try $BOD = 15$, $TRN = 6$, $D_0 = 6.5$

$$\text{Mass bal: } NOD_u = \frac{(26 \times 1.5) + (.5 \times 0.26)}{1.526} = 26$$

D_0 sag in stretch 1 = 6.4 at $t = 0.2$

Sensitivity in Stretch 1:

- 1) double K_1 , min $D_0 = 5.8$
- 2) double K_m , min $D_0 = 5.9$
- 3) $K_2/2$, min $D_0 = 5.3$
- 4) double $K_1, K_m, K_2/2$, min $D_0 = 3.5$ Too Low

⑥ Try $BO_5 = 10$, $TRN = 6$, $DO = 6.5$

Mass bal

$$BO_n = \frac{(1.5 \times 25) + (3 \times 0.26)}{1.526} = 25 \quad K_1 = 0.14, \text{ at } 30^\circ = 22$$

DO sag in stretch 1 = 6.6, at $t = 0.44$, $DO = 6.7$

Sensitivity:

- 1) double K_1 , min $DO = 6.3$
- 2) double K_n , min $DO = 6.2$
- 3) $K_2/2$, min $DO = 5.9$
- 4) double $K_1 + K_n$, $K_2/2$, min $DO = 4.5$

⑦ Try $BO_5 = 10$, $TRN = 5$, $DO = 6.5$

$$\text{Mass bal } NOB_n = \frac{(1.5 \times 22) + (1.5 \times 0.26)}{1.526} = 22$$

DO sag in stretch 1 = 6.7, at $t = 0.44$ $DO = 6.8$

Sensitivity

- * 4) double $K_1 + K_n$, $K_2/2$, min $DO = 4.7$

6

$$\text{For } Q_{\text{STP}} = 2.0 \text{ mgd}$$

$$\text{Try } BOD_5 = 10, TKN = 5, DO = 6.5 \quad K_1 = .22$$

Mass balances, Sketch 1:

$$BOD_u = \frac{(2 \times 25) + (.026 \times 3)}{2.026} = 25$$

$$NOD_u = \frac{(2 \times 22) + (.5 \times .026)}{2.026} = 22$$

$$DO = 6.1$$

$$DO \text{ Sag in Sketch 1} = 6.7, \text{ at } t = 0.44, DO = 6.8$$

Sensitivity:

- 1) double K_1 , min $DO = 6.4$
- 2) double K_n , min $DO = 6.3$
- 3) $K_2/2$, min $DO = 6.0$
- 4) double $K_1 + K_n$, $K_2/2$, min $DO = 4.7$

$$\text{For } Q_{\text{stop}} = 2.5 \text{ mgd}$$

$$\text{Try } BOD_5 = 10, TRN = 5, DO = 6.5$$

Mass balance, sketch 1:

$$BOD_u = \frac{(2.5 \times 25) + (0.26 \times 31)}{2.526} = 25$$

$$NOD_u = \frac{2.5 \times 22 + (0.26 \times 5)}{2.526} = 22$$

$$Da = 1.1$$

$$\text{So, } DO \text{ in Sketch 1} = 6.7, DO \text{ at } t = 0.44 = 6.8$$

Sensitivity:

- 1) double K_1 , min $DO = 6.4$
- 2) double K_m , min $DO = 6.4$
- 3) $K_2/2$, min $DO = 6$
- 4) double K_1 & K_m , $K_2/2$, min $DO = 4.7$

Schetch 2, mass balance with Great Run

$$BOD_u = \frac{23 \times 2.526 + 3 \times 0.93}{2.619} = 22$$

$$NOD_u = \frac{19 \times 2.526 + 1.5 \times 0.93}{2.619} = 18$$

$$DO = \frac{6.8 \times 2.526 + 6.5 \times 0.93}{2.619} = 6.8$$

$$Da = 0.8$$

Sensitivity: double K_1 & K_m , $K_2/2$, min $DO = 5$
OK in Great Run

8

Run model for a discharge directly to Great Run

For $Q_{\text{stop}} = 1.5 \text{ mgd}$

① Try $BOD_5 = 15 \text{ mg/l}$, $TKN = 10 \text{ mg/l}$, $DO = 6.5$

$$\text{Mass balance: } BOD_4 = \frac{38 \times 1.5 + 3 \times 0.93}{1.593} = 36$$

$$NO_3 = \frac{43 \times 1.5 + 1.5 \times 0.93}{1.593} = 41$$

$$D_a = 1.1$$

$t = 1.25 \text{ day}$ from ~~con~~ P_{ad} to Rt 687 bridge (5.1 mi, 0.25 fps)
 K_1 for $15 \text{ mg/l} = 0.27 @ 30^\circ\text{C}$.

Sag $DO = 6.1$ at $t = 0.2$, at $t = 1.25$, $DO = 6.5 \text{ mg/l}$.

Sensitivity

- 1) double K_1 , min $DO = 5.5$
 - 2) double K_m , min $DO = 5.4$
 - 3) $K_2/2$, min $DO = 4.8$
 - 4) double $K_1 + K_m$, $K_2/2$, min $DO = 2.5$
- > Too Low

② Try $BOD_5 = 10$, $TKN = 5 \text{ mg/l}$, $DO = 6.5$
Mass balance

$$BOD_u = \frac{25 \times 1.5 + 3 \times 0.93}{1.593} = 24$$

$$NOD_u = \frac{22 \times 1.5 + 1.5 \times 0.93}{1.593} = 21$$

$$Da = 1.1, K_{1,70} = 0.22$$

$$\text{Say } DO = 6.7 \text{ at } t=0, \text{ at } t=1.25, DO = 7.0$$

Sensitivity

- 1) double K_1 , min $DO = 6.4$
- 2) double K_n , min $DO = 6.4$
- 3) $K_2/2$, min $DO = 6.0$
- 4) double $K_1 + K_n$, $K_2/2$, min $DO = 4.8$

At Q_{STP} of 2.0 & 2.5 m^3/d , limits would be the same ~~due~~ because the STP flow, in effect, becomes the stream (94-96% of flow in the stream ~~comes~~ ~~residuals~~ from the STP).

MEMORANDUM

State Water Control Board

2111 North Hamilton Street

P. O. Box 11143

Richmond, VA. 23231

SUBJECT: Q7-10 for Great Run

TO: Gary Moore, NRO

FROM: S. R. Williams, OWRP *srw*

DATE: May 20, 1985

COPIES:

RECEIVED

MAY 22 1985

BY
NORTHERN REGIONAL
OFFICE

The drainage area for Great Run at the confluence with, and including, X-trib is 13.65 sq. mi. The drainage area for X-trib alone is 3.73 sq. mi.

Using the Cedar Run near Warrenton gage (#01655500) the Q7-10 is 0.0106 cfs.

Therefore:

Great Run: $0.0106 \times 13.65 = 0.144 \text{ cfs}$ (0.093 mgd)

X-trib: $0.0106 \times 3.73 = 0.04 \text{ cfs}$ (0.026 mgd)

hw

MEMORANDUM

2111 North Hamilton Street

State Water Control Board

P. O. Box 11143

Richmond, VA. 2323

SUBJECT: Q7-10 Great Run

TO: S. R. Williams - OWRP

FROM: Gary Moore *Gary Moore*

DATE: May 7, 1985

COPIES:

Steve, thanks very much for your quick response to my previous request for a Q7-10 for the Rapidan River. I have one more request to ask you for, and hope that I won't have to bother you again, at least for awhile.

I need a Q7-10 for Great Run in Fauquier County, at the point where the X-trib which receives the Warrenton STP joins Great Run (see attached topo). I'll need to get a flow for the trib itself, so please include the cfs/sq mi for this area.

Again, I appreciate your timely help on these brush fires, and I am hopeful that these crises will simmer down.

Attachment

/cpm

April 12, 1985

Mr. T. M. Schwarberg, Regional Director
Northern Virginia Regional Office
State Water Control Board
5515 Cherokee Avenue
Alexandria, Virginia 22312

RECEIVED

APR 19 1985

RE: Town of Warrenton
Wastewater Facilities Plan

BY
NORTHERN REGIONAL
OFFICE

Dear Mr. Schwarberg:

On April 4, 1985, we met with Ms. Joan Foundas, Mr. John Hopkins and Mr. Steve Crowther of your office to discuss our preliminary findings for the above referenced project and to request your office to furnish the Town of Warrenton with effluent discharge limitations for a proposed expansion of their existing sewage treatment plant.

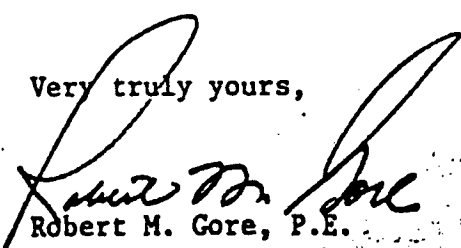
To provide information for the proposed plant expansion and to determine the cost/benefit of reducing infiltration/inflow in the Town's system, we are requesting that your office prepare effluent discharge limits at the existing plant outfall for average plant design flows of 1.5 MGD, 2.0 MGD and 2.5 MGD.

In addition, we wish to evaluate the feasibility of extending the existing plant's outfall along the existing creek approximately one and one half (1½) miles to its confluence with Great Run. It is anticipated that less severe effluent discharge limitations would be imposed at that location. Please provide these limits over the same range of flows as previously requested.

We have included a copy of a portion of the Warrenton USGS topographical map with the location of the new discharge point delineated.

We understand that your office will require at least thirty to forty-five (30-45) days to complete the analysis. Should you have any questions or require additional information, please do not hesitate to contact me.

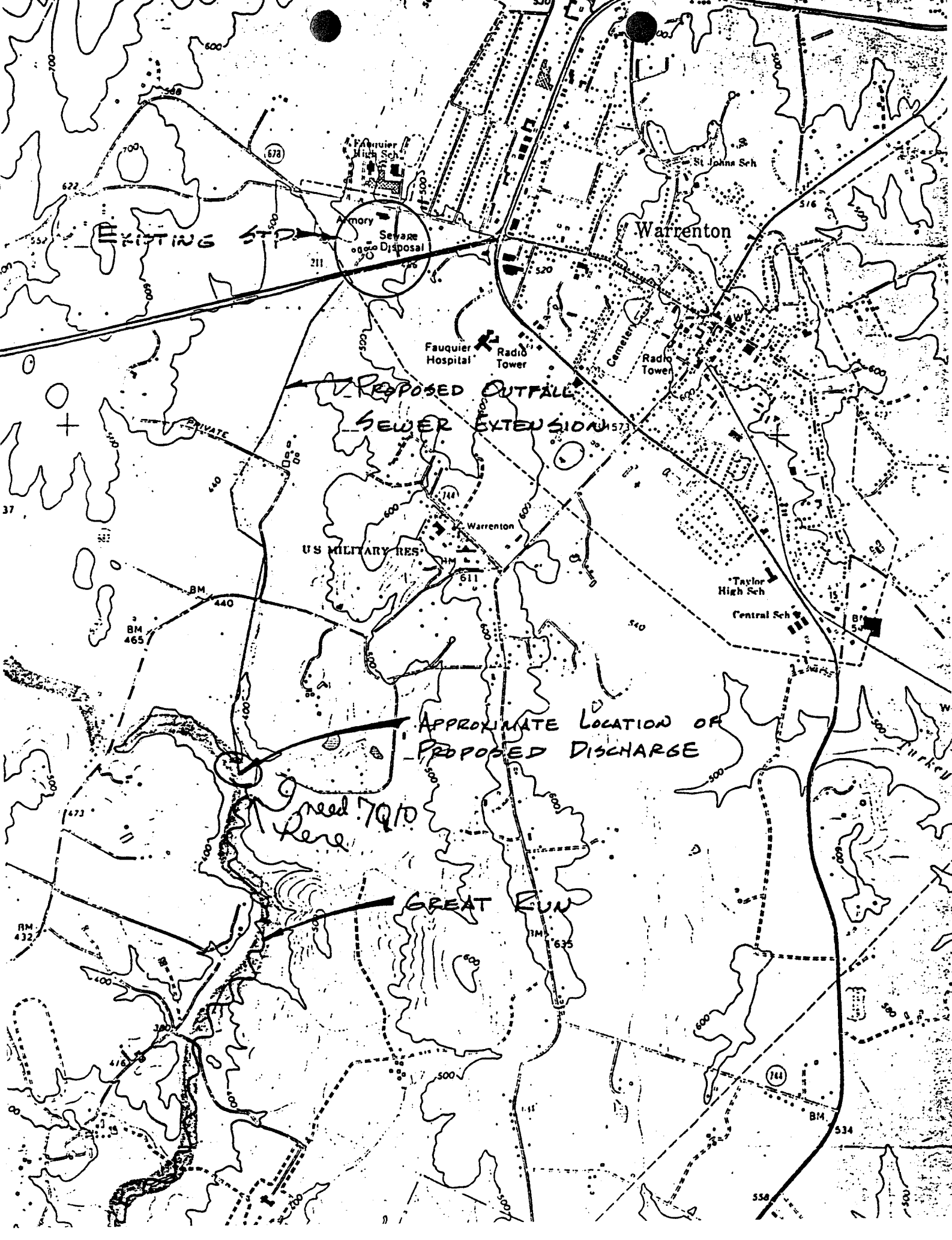
Very truly yours,


Robert M. Gore, P.E.
Project Manager

RMG/ta

cc: Ms. Joan Foundas, SWCB

Mr. E. L. Brower, Town of Warrenton



MEMORANDUM

2111 North Hamilton Street

State Water Control Board

P. O. Box 11143

Richmond, VA. 23221

SUBJECT: Town of Warrenton

TO: Kathy Turner OERS

FROM: Steve C/NRO

DATE: 6-25-86

COPIES: Fx6

Steve - Gary's model (technically speaking) should have been used. Your results are based on our conversation yesterday. I think, based on that it's clear why the first modeling effort should be followed. Kathy

The following model runs were performed for the Warrenton STP discharge. The Town Engineer requested that flows of 3.0, 3.5, 4.0, 4.5 and 5.0 MGD be run for the current discharge location. Gary Moore conducted model runs (attached) (June 5, 1985) of 1.5, 2.0, and 2.5 MGD and determined effluent limits of $BOD_5 = 10 \text{ mg/L}$, $TKN = 5 \text{ mg/L}$ and $DO = 6.5 \text{ mg/L}$. Using the pre-1972 "definition" for maintaining water quality standards (DO above 5.0 mg/L , including sensitivity tests), the limits indicated above are appropriate at all flows requested.

If you have any questions, give me a call.



gpm 6/27/86

Spreadsheet for determination of WET test endpoints or WET limits

Excel 97
Revision Date: 01/10/05
File: WETLIM10.xls
(MIX.EXE required also)

Acute Endpoint/Permit Limit		Use as LC ₅₀ in Special Condition, as T _{Ua} on DMR	
ACUTE	100% =	NOAEC	LC ₅₀ = NA
ACUTE WLA _a	0.30228	Note: Inform the permittee that if the mean of the data exceeds this T _{Ua} : 1.0 a limit may result using WLA _a EXE	

Chronic Endpoint/Permit Limit		Use as NOEC in Special Condition, as T _{Uc} on DMR	
CHRONIC	1.475445341 T _{Uc}	NOEC =	88 % Use as
BOTH*	3.022800074 T _{Uc}	NOEC =	34 % Use as
AML	1.475445341 T _{Uc}	NOEC =	88 % Use as
ACUTE WLA _{a,c}	3.0228	Note: Inform the permittee that if the mean of the data exceeds this T _{Uc} : 1.0 a limit may result using WLA _a EXE	
CHRONIC WLA _c	1.0088	* Both means acute expressed as chronic	

Enter data in the cells with blue type:

Entry Date: 10/06/10
Facility Name: Warrenton WWTP
VPDES Number: VA0021172
Outfall Number: 1

Plant Flow: 2.5 MGD
Acute 1Q10: 0.019 MGD
Chronic 7Q10: 0.022 MGD

Are data available to calculate CV? (Y/N) N
Are data available to calculate ACR? (Y/N) N

IWC_a 99.24573243 % Plant flow/plant flow + 1Q10
IWC_c 99.12767645 % Plant flow/plant flow + 7Q10

Dilution, acute 1.0076 100/IWC_a
Dilution, chronic 1.0088 100/IWC_c

WLA_a 0.30228 Instream criterion (0.3 T_{Ua}) X's Dilution, acute
WLA_c 1.0088 Instream criterion (1.0 T_{Uc}) X's Dilution, chronic
WLA_{a,c} 3.0228 ACR X's WLA_a - converts acute WLA to chronic units

ACR acute/chronic ratio 10 LC50/NOEC (Default is 10 - if data are available, use tables Page 3)
CV-Coefficient of variation 0.6 Default of 0.6 - if data are available, use tables Page 2)
Constants eA 0.4109447 Default = 0.41
eB 0.6010373 Default = 0.60
eC 2.4334175 Default = 2.43
eD 2.4334175 Default = 2.43 (1 samp) No. of sample: 1

LTA_{a,c} 1.242203639 WLA_{a,c} X's eA
LTA_c 0.606326428 WLA_c X's eB
MDL** with LTA_{a,c} 3.022800074 T_{Uc} NOEC = 33.081910 (Protects from acute/chronic toxicity)
MDL** with LTA_c 1.475445341 T_{Uc} NOEC = 67.776147 (Protects from chronic toxicity)
AML with lowest LTA 1.475445341 T_{Uc} NOEC = 67.776147 Lowest LTA X's eD

IF ONLY ACUTE ENDPOINT/LIMIT IS NEEDED, CONVERT MDL FROM T_{Uc} to T_{Ua}

MDL with LTA_{a,c} 0.302280007 T_{Ua} LC50 = 330.818100 % Use NOAEC=100%
MDL with LTA_c 0.147544534 T_{Ua} LC50 = 677.761468 % Use NOAEC=100%

NOTE: If the IWC_a is >33%, specify the
NOAEC = 100% test/endpoint for use

Diluter /modeling study?
Enter Y/N N
Acute 1:1
Chronic 1:1

Go to Page 2
Go to Page 3

**The Maximum Daily Limit is calculated from the lowest LTA, X's eC. The LTA_{a,c} and MDL using it are driven by the ACR.

Rounded NOEC's
NOEC = 34 %
NOEC = 68 %
NOEC = 68

Rounded LC50's
LC50 = NA
LC50 = NA

Page 2 - Follow the directions to develop a site specific CV (coefficient of variation)

IF YOU HAVE AT LEAST 10 DATA POINTS THAT ARE QUANTIFIABLE (NOT "<" OR ">") FOR A SPECIES, ENTER THE DATA IN EITHER COLUMN "G" (VERTEBRATE) OR COLUMN "J" (INVERTEBRATE). THE "CV" WILL BE PICKED UP FOR THE CALCULATIONS BELOW. THE DEFAULT VALUES FOR eA, eB, AND eC WILL CHANGE IF THE "CV" IS ANYTHING OTHER THAN 0.6.

Coefficient of Variation for effluent tests

CV = 0.6 (Default 0.6)

$\sigma^2 = 0.3074847$

$\delta = 0.554513029$

Using the log variance to develop eA

(P. 100, step 2a of TSD)

Z = 1.881 (97% probability stat from table)

A = -0.88929666

eA = 0.410944686

Using the log variance to develop eB

(P. 100, step 2b of TSD)

$\delta_e^2 = 0.086177696$

$\delta_e = 0.293560379$

B = -0.50909823

eB = 0.601037335

Using the log variance to develop eC

(P. 100, step 4a of TSD)

$\sigma^2 = 0.3074847$

$\delta = 0.554513029$

C = 0.889296658

eC = 2.433417525

Using the log variance to develop eD

(P. 100, step 4b of TSD)

n = 1

$\delta_n^2 = 0.3074847$

$\delta_n = 0.554513029$

D = 0.889296658

eD = 2.433417525

Vertebrate
IC₂₅ Data
or
LC₅₀ Data

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LN of data

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LN of data

Page 3 - Follow directions to develop a site specific ACR (Acute to Chronic Ratio)

To determine Acute/Chronic Ratio (ACR), insert usable data below. Usable data is defined as valid paired test results, acute and chronic, tested at the same temperature, same species. The chronic NOEC must be less than the acute LC₅₀, since the ACR divides the LC₅₀ by the NOEC. LC₅₀'s >100% should not be used.

Table 1. ACR using Vertebrate data

Set #	LC ₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog ACR to Use
1	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
2	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
3	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
4	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
5	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
6	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
7	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
8	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
9	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
10	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA

ACR for vertebrate data:

Table 1. Result:	0
Table 2. Result:	0
	Default to 10

Table 2. ACR using Invertebrate data

Set #	LC ₅₀	NOEC	Test ACR	Logarithm	Geomean	Antilog ACR to Use
1	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
2	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
3	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
4	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
5	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
6	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
7	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
8	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
9	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA
10	#/N/A	#/N/A	#/N/A	#/N/A	#/N/A	NO DATA

ACR for invertebrate data:

DILUTION SERIES TO RECOMMEND

Table 4.

	Monitoring % Effluent	Limit % Effluent	IUc	IUc
Dilution series based on data mean	100	1.0	68	1,470,5882
Dilution series to use for limit	0.5		0.8246211	
Dilution factor to recommend:				
Dilution series to recommend:	100.0	1.00	100.0	1.00
	50.0	2.00	82.5	1.21
	25.0	4.00	68.0	1.47
	12.5	8.00	56.1	1.78
	6.25	16.00	46.2	2.16
Extra dilutions if needed	3.12	32.05	38.1	2.62
	1.56	64.10	31.4	3.18

Table 3. Convert LC₅₀'s and NOEC's to Chronic TU's for use in WLA.EXE
ACR used: 10

	Enter LC ₅₀	IUc	Enter NOEC	IUc
1		NO DATA		NO DATA
2		NO DATA		NO DATA
3		NO DATA		NO DATA
4		NO DATA		NO DATA
5		NO DATA		NO DATA
6		NO DATA		NO DATA
7		NO DATA		NO DATA
8		NO DATA		NO DATA
9		NO DATA		NO DATA
10		NO DATA		NO DATA
11		NO DATA		NO DATA
12		NO DATA		NO DATA
13		NO DATA		NO DATA
14		NO DATA		NO DATA
15		NO DATA		NO DATA
16		NO DATA		NO DATA
17		NO DATA		NO DATA
18		NO DATA		NO DATA
19		NO DATA		NO DATA
20		NO DATA		NO DATA

If WLA.EXE determines that an acute limit is needed, you need to convert the TUc answer you get to TUa and then an LC₅₀, enter it here:

NO DATA %LC₅₀
NO DATA TUa

Cell: I9

Comment:

This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: K18

Comment:

This is assuming that the data are Type 2 data (none of the data in the data set are censored - "<" or ">").

Cell: J22

Comment:

Remember to change the "N" to "Y" if you have ratios entered, otherwise, they won't be used in the calculations.

Cell: C40

Comment:

If you have entered data to calculate an ACR on page 3, and this is still defaulted to "10", make sure you have selected "Y" in cell E21

Cell: C41

Comment:

If you have entered data to calculate an effluent specific CV on page 2, and this is still defaulted to "0.6", make sure you have selected "Y" in cell E20

Cell: L48

Comment:

See Row 151 for the appropriate dilution series to use for these NOEC's

Cell: G52

Comment:

Vertebrates are:
Pimephales promelas
Oncorhynchus mykiss
Cyprinodon variegatus

Cell: J52

Comment:

Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

Cell: C117

Comment:

Vertebrates are:
Pimephales promelas
Cyprinodon variegatus

Cell: M119

Comment:

The ACR has been picked up from cell C34 on Page 1. If you have paired data to calculate an ACR, enter it in the tables to the left, and make sure you have a "Y" in cell E21 on Page 1. Otherwise, the default of 10 will be used to convert your acute data.

Cell: M121

Comment:

If you are only concerned with acute data, you can enter it in the NOEC column for conversion and the number calculated will be equivalent to the TUs. The calculation is the same: $100/\text{NOEC} = \text{TUs}$ or $100/\text{LC50} = \text{TUs}$.

Cell: C138

Comment:

Invertebrates are:
Ceriodaphnia dubia
Mysidopsis bahia

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY

Northern Regional Office

13901 Crown Court

Woodbridge, VA 22193

(703) 583-3800

SUBJECT: TOXICS MANAGEMENT PROGRAM DATA REVIEW
Warrenton Sewage Treatment Plant (VA0021172)
REVIEWER: Douglas Frasier
DATE: 28 August 2009
COPIES: TMP file

PREVIOUS REVIEW: 13 August 2008

DATA REVIEWED:

This review covers the fifth annual chronic toxicity tests conducted in June 2009 for Outfall 001.

DISCUSSION:

The results of these toxicity tests, along with the results of previous acute and chronic toxicity tests conducted on effluent samples collected from Outfall 001 are summarized in Table 1.

The chronic toxicity of the effluent samples were determined with a 3-brood static daily renewal survival and reproduction test performed on *C. dubia* and a 7-day daily renewal larval survival and growth test performed on *P. promelas* using 24-hour flow-proportioned composite samples.

The *C. dubia* chronic test and the *P. promelas* chronic tests yielded a No Observed Effect Concentration (NOEC) of 100%, thus passing the chronic toxicity criteria.

CONCLUSION:

The chronic toxicity tests are valid and the test results acceptable.

FACILITY INFORMATION

FACILITY: Warrenton Sewage Treatment Plant

LOCATION: 731 Frost Avenue, Warrenton, Fauquier County
(0.3 miles west of Warrenton on Route 211)

VPDES#: VA0021172

TYPE OF FACILITY: Municipal, major

REGION/PERMIT WRITER: NRO / Joan Crowther

PERMIT EFFECTIVE DATE: 16 February 2005 / Modification 14 November 2007

SIC CODE/DESCRIPTION: 4952 / sewage treatment plant

MAIN INDUSTRIAL CONTRIBUTORS/SIC: Flex-Cut, Inc. / 3549 (since 4/95)

OUTFALL/FLOW (MGD): Outfall 001/2.5 MGD

TREATMENT: The treatment facilities consist of bar screens, grit removal, primary clarifiers, biological treatment using trickling filter and three Rotating Biological Contactor units with chemical precipitation, secondary clarifiers, chlorine disinfection, and dechlorination. Solids handling processes include gravity thickening, digestion, dewatering with belt filter press.

RECEIVING STREAM/7Q10/IWC: Great Run, UT; Rappahannock River Basin;
Section 4; Class III; Special Standards: q
7Q10: 0.0 MGD / IWC: 99%

TMP EFFECTIVE DATE: 17 December 1990 (CTO issued)

TMP REQUIREMENTS: Annual chronic toxicity tests for the duration of the permit using 24-hour flow-proportioned composite samples of final effluent from outfall 001. The chronic tests shall be static renewal tests using *Ceriodaphnia dubia* and *Pimephales promelas*. The chronic test on *Ceriodaphnia dubia* shall be 3-brood survival and reproduction test while the chronic test on *Pimephales promelas* shall be 7-day survival and growth test.

Chronic NOEC end point \geq 99%; 1.0 TU_c

TESTING LABORATORY: Coastal Bioanalysts, Incorporated

BIOMONITORING RESULTS

Town of Warrenton Sewage Treatment Plant (VA0021172)

Table 1
Summary of Toxicity Test Results for Outfall 001

TEST DATE	TEST TYPE/ORGANISM	IC ₂₅ (%)	48-h LC ₅₀ (%)	NOEC (%)	% SURV	LAB	REMARKS
02/10/94	48-hr Acute <i>D. pulex</i>		>100		95	ESS	1st quarterly
02/10/94	96-hr Acute <i>P. promelas</i>		>100		100	ESS	
02/08/94	Chronic <i>C. dubia</i>			100 SR	100	ESS	
02/08/94	Chronic <i>P. promelas</i>			100 SG	100	ESS	
04/21/94	48-hr Acute <i>D. pulex</i>		>100		100	ESS	2nd quarterly
04/21/94	96-hr Acute <i>P. promelas</i>		>100		100	ESS	
04/19/94	Chronic <i>C. dubia</i>			100 SR	100	ESS	
04/19/94	Chronic <i>P. promelas</i>			100 SG	98	ESS	
07/14/94	48-hr Acute <i>D. pulex</i>		>100		100	ESS	3rd quarterly
07/14/94	96-hr Acute <i>P. promelas</i>		>100		100	ESS	
07/12/94	Chronic <i>C. dubia</i>			100 SR	90	ESS	
07/12/94	Chronic <i>P. promelas</i>			100 SG	90	ESS	
10/27/94	48-hr Acute <i>D. pulex</i>		>100		100	ESS	4th quarterly
10/27/94	96-hr Acute <i>P. promelas</i>		>100		100	ESS	
10/25/94	Chronic <i>C. dubia</i>			100 SR	90	ESS	
10/25/94	Chronic <i>P. promelas</i>			100 SG	95	ESS	
06/23/95	48-hr Acute <i>D. pulex</i>		>100		90	CBI	1st annaul
06/23/95	96-hr Acute <i>P. promelas</i>		>100		100	CBI	
06/20/95	Chronic <i>C. dubia</i>			12.5 R	100	CBI	
06/20/95	Chronic <i>P. promelas</i>			100 SG	93	CBI	
09/13/95	Chronic <i>C. dubia</i>			100 SR	90	CBI	retest
06/14/96	Acute <i>P. promelas</i>		INV			CBI	2nd annual
06/12/96	Chronic <i>C. dubia</i>			INV		CBI	
09/20/96	Acute <i>P. promelas</i>		>100		100	CBI	retest
09/18/96	Chronic <i>C. dubia</i>			100 SR	90	CBI	
05/15/97	Acute <i>P. promelas</i>		>100		100	CBI	3rd annual
05/13/97	Chronic <i>C. dubia</i>			100 SR	100	CBI	
05/20/98	Acute <i>P. promelas</i>		>100		95	CBI	4th annual
05/18/98	Chronic <i>C. dubia</i>			100 SR	90	CBI	
Permit reissued 29 November 1999							
04/13/00	Acute <i>P. promelas</i>		>100		100	CBI	1st annual
04/11/00	Chronic <i>C. dubia</i>			100 SR	100	CBI	
03/29/01	Acute <i>P. promelas</i>		>100		100	CBI	2nd annual
04/24/01	Chronic <i>C. dubia</i>	>100	>100	100 SR	100	CBI	
03/28/02	Acute <i>P. promelas</i>		>100		90	CBI	3rd annual
03/26/02	Chronic <i>C. dubia</i>	>100	>100	100 SR	100	CBI	
04/10/03	Acute <i>P. promelas</i>		INV		100	CBI	4th annual;
04/08/03	Chronic <i>C. dubia</i>	>100	>100	100 SR	100	CBI	
06/19/03	Acute <i>P. promelas</i>		>100		100	CBI	Retest

TEST DATE	TEST TYPE/ORGANISM	IC ₂₅ (%)	48-h LC ₅₀ (%)	NOEC (%)	% SURV	LAB	REMARKS
03/24/04	Acute <i>P. promelas</i>		>100		100	CBI	5th annual
03/23/04	Chronic <i>C. dubia</i>	77.3	>100	50 SR	50	CBI	
06/16/04	Acute <i>P. promelas</i>		>100		100	CBI	Retest; Invalid
06/15/04	Chronic <i>C. dubia</i>	>100	>100	100 SR	100	CBI	
09/14/04	Chronic <i>C. dubia</i>	>100	>100	100 SR	100	CBI	Retest
Permit Reissued 16 February 2005							
04/19/05	Acute <i>P. promelas</i>		>100		100	CBI	Samples not
04/14/05	Chronic <i>C. dubia</i>	>100	>100	100 SR	100	CBI	Chilled properly
04/11/06	Chronic <i>C. dubia</i>	60.8	>100	100 S 50 G	90	CBI	Retest
04/12/06	Acute <i>P. promelas</i>		>100		100	CBI	Retest
10/03/06	Chronic <i>C. dubia</i>	>100	>100	100 SR	100	CBI	Retest
05/08/07	Chronic <i>C. dubia</i>	>100	>100	100 SR	100	CBI	3 rd annual
05/08/07	Chronic <i>P. promelas</i>	>100	>100	100 SG	93	CBI	
06/03/08	Chronic <i>C. dubia</i>	>100	>100	100 SR	90	CBI	4 th annual
06/03/08	Chronic <i>P. promelas</i>	>100	>100	100 SG	93	CBI	
06/16/09	Chronic <i>C. dubia</i>	>100	>100	100 SR	90	CBI	5 th annual
06/16/09	Chronic <i>P. promelas</i>	>100	>100	100 SG	95	CBI	

FOOTNOTES:

A **boldfaced** value for LC₅₀ or NOEC indicates that the test failed the toxicity criteria.

ABBREVIATIONS:

S - Survival; R - Reproduction; G - Growth
 % SURV - Percent survival in 100% effluent
INV - Invalid test
 ESS - Environmental Systems Service, Ltd.
 CBI - Coastal Bioanalysts Inc.

Public Notice – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in the Town of Warrenton, Fauquier County, Virginia.

PUBLIC COMMENT PERIOD: XXX, 2010 to 5:00 p.m. on XXX, 2010

PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board

APPLICANT NAME, ADDRESS AND PERMIT NUMBER: Town of Warrenton, P. O. Drawer 341, Warrenton, VA 20188, VA0021172

NAME AND ADDRESS OF FACILITY: Town of Warrenton Wastewater Treatment Plant, 731 Frost Avenue, Warrenton, VA 20188

PROJECT DESCRIPTION: Town of Warrenton has applied for a reissuance of a permit for the public Town of Warrenton Wastewater Treatment Plant. The applicant proposes to release treated sewage wastewaters from Town of Warrenton's service area at a rate of 2.5 million gallons per day into a water body. The sludge will be disposed by Recyc Systems, INC authorized by VPA Permit No. VPA00004. The facility proposes to release the treated sewage in the unnamed tributary to Great Run in Town of Warrenton, Fauquier County in the Rappahannock River watershed. A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: pH, BOD₅, Total Suspended Solids, Dissolved Oxygen, Ammonia as N, *E. coli*, Total Nitrogen and Total Phosphorus.

This facility is subject to the requirements of 9 VAC 25-820 and has registered for coverage under the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Watershed in Virginia.

HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requestor, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.

CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS AND ADDITIONAL INFORMATION: The public may review the documents at the DEQ-Northern Regional Office by appointment, or may request electronic copies of the draft permit and fact sheet.

Name: Joan C. Crowther

Address: DEQ-Northern Regional Office, 13901 Crown Court, Woodbridge, VA 22193

Phone: (703) 583-3925 E-mail: joan.crowther@deq.virginia.gov Fax: (703) 583-3821

Attachment
13

**State "Transmittal Checklist" to Assist in Targeting
Municipal and Industrial Individual NPDES Draft Permits for Review**

Part I. State Draft Permit Submission Checklist

In accordance with the MOA established between the Commonwealth of Virginia and the United States Environmental Protection Agency, Region III, the Commonwealth submits the following draft National Pollutant Discharge Elimination System (NPDES) permit for Agency review and concurrence.

Facility Name:	Town of Warrenton Wastewater Treatment Plant
NPDES Permit Number:	VA0021172
Permit Writer Name:	Joan C. Crowther
Date:	December 6, 2010

Major ☒]Minor ☐]Industrial ☐]Municipal ☒]**I.A. Draft Permit Package Submittal Includes:**

	Yes	No	N/A
1. Permit Application?	X		
2. Complete Draft Permit (for renewal or first time permit – entire permit, including boilerplate information)?	X		
3. Copy of Public Notice?	X		
4. Complete Fact Sheet?	X		
5. A Priority Pollutant Screening to determine parameters of concern?	X		
6. A Reasonable Potential analysis showing calculated WQBELs?	X		
7. Dissolved Oxygen calculations?	X		
8. Whole Effluent Toxicity Test summary and analysis?	X		
9. Permit Rating Sheet for new or modified industrial facilities?			X

I.B. Permit/Facility Characteristics

	Yes	No	N/A
1. Is this a new, or currently unpermitted facility?		X	
2. Are all permissible outfalls (including combined sewer overflow points, non-process water and storm water) from the facility properly identified and authorized in the permit?	X		
3. Does the fact sheet or permit contain a description of the wastewater treatment process?	X		
4. Does the review of PCS/DMR data for at least the last 3 years indicate significant non-compliance with the existing permit?	X		
5. Has there been any change in streamflow characteristics since the last permit was developed?	X		
6. Does the permit allow the discharge of new or increased loadings of any pollutants?		X	
7. Does the fact sheet or permit provide a description of the receiving water body(s) to which the facility discharges, including information on low/critical flow conditions and designated/existing uses?	X		
8. Does the facility discharge to a 303(d) listed water?	X		
a. Has a TMDL been developed and approved by EPA for the impaired water?	X		
b. Does the record indicate that the TMDL development is on the State priority list and will most likely be developed within the life of the permit?			X
c. Does the facility discharge a pollutant of concern identified in the TMDL or 303(d) listed water?	X		
9. Have any limits been removed, or are any limits less stringent, than those in the current permit?	X		
10. Does the permit authorize discharges of storm water?		X	

I.B. Permit/Facility Characteristics – cont.	Yes	No	N/A
11. Has the facility substantially enlarged or altered its operation or substantially increased its flow or production?		X	
12. Are there any production-based, technology-based effluent limits in the permit?		X	
13. Do any water quality-based effluent limit calculations differ from the State's standard policies or procedures?		X	
14. Are any QBELs based on an interpretation of narrative criteria?		X	
15. Does the permit incorporate any variances or other exceptions to the State's standards or regulations?		X	
16. Does the permit contain a compliance schedule for any limit or condition?		X	
17. Is there a potential impact to endangered/threatened species or their habitat by the facility's discharge(s)?		X	
18. Have impacts from the discharge(s) at downstream potable water supplies been evaluated?	X		
19. Is there any indication that there is significant public interest in the permit action proposed for this facility?		X	
20. Have previous permit, application, and fact sheet been examined?	X		

Part II. NPDES Draft Permit Checklist

Region III NPDES Permit Quality Checklist – for POTWs (To be completed and included in the record only for POTWs)

II.A. Permit Cover Page/Administration

	Yes	No	N/A
1. Does the fact sheet or permit describe the physical location of the facility, including latitude and longitude (not necessarily on permit cover page)?	X		
2. Does the permit contain specific authorization-to-discharge information (from where to where, by whom)?	X		

II.B. Effluent Limits – General Elements

	Yes	No	N/A
1. Does the fact sheet describe the basis of final limits in the permit (e.g., that a comparison of technology and water quality-based limits was performed, and the most stringent limit selected)?	X		
2. Does the fact sheet discuss whether “antibacksliding” provisions were met for any limits that are less stringent than those in the previous NPDES permit?	X		

II.C. Technology-Based Effluent Limits (POTWs)

	Yes	No	N/A
1. Does the permit contain numeric limits for <u>ALL</u> of the following: BOD (or alternative, e.g., CBOD, COD, TOC), TSS, and pH?	X		
2. Does the permit require at least 85% removal for BOD (or BOD alternative) and TSS (or 65% for equivalent to secondary) consistent with 40 CFR Part 133?	X		
a. If no, does the record indicate that application of WQBELs, or some other means, results in more stringent requirements than 85% removal or that an exception consistent with 40 CFR 133.103 has been approved?			X
3. Are technology-based permit limits expressed in the appropriate units of measure (e.g., concentration, mass, SU)?	X		
4. Are permit limits for BOD and TSS expressed in terms of both long term (e.g., average monthly) and short term (e.g., average weekly) limits?	X		
5. Are any concentration limitations in the permit less stringent than the secondary treatment requirements (30 mg/l BOD5 and TSS for a 30-day average and 45 mg/l BOD5 and TSS for a 7-day average)?		X	
a. If yes, does the record provide a justification (e.g., waste stabilization pond, trickling filter, etc.) for the alternate limitations?			X

II.D. Water Quality-Based Effluent Limits

	Yes	No	N/A
1. Does the permit include appropriate limitations consistent with 40 CFR 122.44(d) covering State narrative and numeric criteria for water quality?	X		
2. Does the fact sheet indicate that any WQBELs were derived from a completed and EPA approved TMDL?	X		
3. Does the fact sheet provide effluent characteristics for each outfall?	X		
4. Does the fact sheet document that a “reasonable potential” evaluation was performed?	X		
a. If yes, does the fact sheet indicate that the “reasonable potential” evaluation was performed in accordance with the State’s approved procedures?	X		
b. Does the fact sheet describe the basis for allowing or disallowing in-stream dilution or a mixing zone?	X		
c. Does the fact sheet present WLA calculation procedures for all pollutants that were found to have “reasonable potential”?	X		
d. Does the fact sheet indicate that the “reasonable potential” and WLA calculations accounted for contributions from upstream sources (i.e., do calculations include ambient/background concentrations)?	X		
e. Does the permit contain numeric effluent limits for all pollutants for which “reasonable potential” was determined?	X		

II.D. Water Quality-Based Effluent Limits – cont.	Yes	No	N/A
5. Are all final WQBELs in the permit consistent with the justification and/or documentation provided in the fact sheet?	X		
6. For all final WQBELs, are BOTH long-term AND short-term effluent limits established?	X		
7. Are WQBELs expressed in the permit using appropriate units of measure (e.g., mass, concentration)?	X		
8. Does the record indicate that an “antidegradation” review was performed in accordance with the State’s approved antidegradation policy?	X		

II.E. Monitoring and Reporting Requirements	Yes	No	N/A
1. Does the permit require at least annual monitoring for all limited parameters and other monitoring as required by State and Federal regulations?	X		
a. If no, does the fact sheet indicate that the facility applied for and was granted a monitoring waiver, AND, does the permit specifically incorporate this waiver?			X
2. Does the permit identify the physical location where monitoring is to be performed for each outfall?	X		
3. Does the permit require at least annual influent monitoring for BOD (or BOD alternative) and TSS to assess compliance with applicable percent removal requirements?		X	
4. Does the permit require testing for Whole Effluent Toxicity?	X		

II.F. Special Conditions	Yes	No	N/A
1. Does the permit include appropriate biosolids use/disposal requirements?	X		
2. Does the permit include appropriate storm water program requirements?			X

II.F. Special Conditions – cont.	Yes	No	N/A
3. If the permit contains compliance schedule(s), are they consistent with statutory and regulatory deadlines and requirements?			X
4. Are other special conditions (e.g., ambient sampling, mixing studies, TIE/TRE, BMPs, special studies) consistent with CWA and NPDES regulations?			X
5. Does the permit allow/authorize discharge of sanitary sewage from points other than the POTW outfall(s) or CSO outfalls [i.e., Sanitary Sewer Overflows (SSOs) or treatment plant bypasses]?		X	
6. Does the permit authorize discharges from Combined Sewer Overflows (CSOs)?		X	
a. Does the permit require implementation of the “Nine Minimum Controls”?			X
b. Does the permit require development and implementation of a “Long Term Control Plan”?			X
c. Does the permit require monitoring and reporting for CSO events?			X
7. Does the permit include appropriate Pretreatment Program requirements?	X		

II.G. Standard Conditions		Yes	No	N/A
1. Does the permit contain all 40 CFR 122.41 standard conditions or the State equivalent (or more stringent) conditions?		X		
List of Standard Conditions – 40 CFR 122.41				
Duty to comply	Property rights	Reporting Requirements		
Duty to reapply	Duty to provide information	Planned change		
Need to halt or reduce activity	Inspections and entry	Anticipated noncompliance		
not a defense	Monitoring and records	Transfers		
Duty to mitigate	Signatory requirement	Monitoring reports		
Proper O & M	Bypass	Compliance schedules		
Permit actions	Upset	24-Hour reporting		
		Other non-compliance		
2. Does the permit contain the additional standard condition (or the State equivalent or more stringent conditions) for POTWs regarding notification of new introduction of pollutants and new industrial users [40 CFR 122.42(b)]?		X		



April 15, 2011

Allen Chichester
Town of Warrenton
P.O. Box 341
Warrenton, Va. 22186

Re: Outfall 001 Permit Renewal Round One – Metals Data

Dear Mr. Stoddard:

Environmental Systems Service, Ltd. (ESS) is pleased to submit the results for clean metals sampling conducted on March 3, 2011. All samples were grab samples and were collected along with all non-metals parameters. Metals were analyzed by Albion Environmental. Attachments include the chain of custody for all metals analysis.

Parameter	Reported Level (ppb)
	Dissolved
Antimony	<0.30
Arsenic	<1.0
Beryllium	<0.50
Cadmium	<0.10
Chromium	<1.0
Copper	3.85
Lead	0.15
Mercury	<0.20
Nickel	1.89
Selenium	<2.0
Silver	<0.10
Thallium	<0.10
Zinc	31.5

ESS appreciates the opportunity to provide clean sampling and analytical services. If you have any questions, please feel free to contact me at 540-825-6660.

Sincerely,

Andria Swann, Environmental Technician
Environmental Services Division
Attachments

ENVIRONMENTAL SYSTEMS SERVICE, LTD.

218 North Main St.	500 Stone St.	5111 College Ave.
Post Office Box 520	Post Office Box 736	College Park, MD 20740
Culpeper, VA 22701	Bedford, VA 24523	
800-541-2116	540-586-5413	301-779-0606
540-825-6660	Fax 540-586-5530	Fax 301-779-9225
Fax 540-825-4961		

ANALYSES

SAMPLE NO.	DATE	TIME	SAMPLE LOCATION	CONTAINERS SIZE G/P #	G/R/B #	COMP	SAMPLE MATRIX	PRESERVATIVE	Hg	COMMENTS
	3/3/11	10:25	Effluent - TR 12 TM Field Blank	125 P 1 X	*BW	none	X	Metals=Sb, As, Be,		
			Effluent - TR Hg Field Blank	125 G 1 X	*BW	none	X	Cd, Cr, Cu, Pb, Ni,		
			Effluent - TR 12 TM Grab	125 P 1 X	ww	none	X	Se, Ag, Ti, Zn		
			Effluent - TR Hg Grab	250 G 1 X	ww	none	X	*BW=Blank Water		
Relinquished by:	Date	Time	Received by:	Date	Time	Relinquished by:			Date	
[Signature]	3/3/11	10:11	sant J.A. JPS	3/4/11						
Relinquished by:	Date	Time	Received by:	Date	Time	Relinquished by:			Date	
Method of Delivery						TAT				
<input type="checkbox"/> UPS <input type="checkbox"/> Fed Ex <input type="checkbox"/> Hand Delivery <input type="checkbox"/> UPS Overnight <input type="checkbox"/> Post Office						Normal _____ Rush _____ Need Results by _____				
Remarks:						Amount Paid \$ _____				
						Check # _____ W.O.# _____				

Crowther, Joan (DEQ)

From: Andria Hannegan [AndriaH@ess-services.com]
Sent: Monday, April 18, 2011 2:37 PM
To: Crowther, Joan (DEQ)
Subject: RE: Permit Renewal Round One

Hello Joan,

I'd be more than happy to provide the DL for the below mentioned sampling event.
I have listed them below, along with the results. Would you like me to submit a revised report for this facility?

Parameter	Reported Level (ppb)	Detection Level (ppb)
	Dissolved	
Antimony	<0.30	0.30
Arsenic	<1.0	1.00
Beryllium	<0.50	0.50
Cadmium	<0.10	0.10
Chromium	<1.0	1.0
Copper	3.85	0.30
Lead	0.15	0.050
Mercury	<0.20	0.20
Nickel	1.89	1.0
Selenium	<2.0	2.0
Silver	<0.10	0.10
Thallium	<0.10	0.10
Zinc	31.5	0.50

Let me know if you have any questions.

Regards,
Andria

From: Crowther, Joan (DEQ) [<mailto:Joan.Crowther@deq.virginia.gov>]
Sent: Monday, April 18, 2011 2:03 PM
To: AndriaH@ess-services.com
Cc: achiches@warrentonva.gov
Subject: FW: Permit Renewal Round One

Hi Andria,

Could you provide the detection level for the metals samples that were run for the Town of Warrenton?

Thanks,

Joan

Joan C. Crowther
VPDES Permit Writer
Virginia Department of Environmental Quality
Northern Regional Office

13901 Crown Court
Woodbridge, VA 22193
(703) 583-3925

Email address: joan.crowther@deq.virginia.gov

From: Allen Chichester [mailto:]
Sent: Friday, April 15, 2011 1:57 PM
To: Crowther, Joan (DEQ)
Subject: FW: Permit Renewal Round One

Hi Joan, I'm forwarding these results to you.

Have a good weekend!

allen

From: Andria Hannegan [mailto:AndriaH@ess-services.com]
Sent: Friday, April 15, 2011 1:06 PM
To: Allen Chichester
Subject: Permit Renewal Round One

Allen,

Attached is the report for the clean metals collected at your facility. Let me know if you have any questions.
☺ Andria

Andria Swann, Environmental Technician
Environmental Services Division

Environmental System Services, Ltd.
218 North Main Street
Culpeper, Va. 22701
Office: (540) 825-6660
Fax: (540) 825-4961
Email: andriah@ess-services.com



ENVIRONMENTAL SYSTEMS SERVICE, LTD.

WARRENTON, TOWN OF
MR. BILL STODDARD
P. O. BOX 341
WARRENTON, VA 22186

Page: 1

Work Order #: 15484
Contract #:
Customer #: 751
Customer PO #:

Job Location: PERMIT RENEWAL - ROUND 1
Collected by: ANDRIA SWANN
Date Received: 03/03/2011

ANALYSIS REPORT

COMMENT: 2,3,7,8-TETRACHLORODIBENZO-P-DIOXIN WAS NOT
DETECTED IN THE SAMPLE.

TAG #: 45710
SAMPLE POINT: OUTFALL 001

SAMPLE DATE:
03/03/2011

Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
Total Cyanide*	<0.005	mg/l	0.005	EPA 335.4	03/09/11	11:54	LEF
Total Hardness as CaCO3	131	mg/l	2	SM 2340 C	03/07/11	14:00	JI
Volatiles*	--				00/00/00		--
1,1,1-Trichloroethane	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
1,1,2,2-Tetrachloroethane	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
1,1,2-Trichloroethane	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
1,2-Dichlorobenzene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
1,1-Dichloroethane	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
1,1-Dichloroethene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
1,2-Dichloroethane	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
1,2-Dichloropropane	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
2-Chloroethylvinylether	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Acrolein	<50	ug/l	50	EPA 624	03/09/11	10:15	GXF
Acrylonitrile	<50	ug/l	50	EPA 624	03/09/11	10:15	GXF
Benzene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Bromoform	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Bromomethane	<10	ug/l	10	EPA 624	03/09/11	10:15	GXF
Carbon Tetrachloride	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Chlorobenzene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Chlorodibromomethane	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF

Reviewed by:

Angie Woodward
A. Woodward/Technical Director

Report Date: March 23, 2011
VA LAB ID# 460019

* Subcontracted test



ENVIRONMENTAL SYSTEMS SERVICE, LTD.

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Job Location: PERMIT RENEWAL - ROUND 1

Collected by: ANDRIA SWANN

Date Received: 03/03/2011

ANALYSIS REPORT

Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
Chloroethane	<10	ug/l	10	EPA 624	03/09/11	10:15	GXF
Chloroform	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Chloromethane	<10	ug/l	10	EPA 624	03/09/11	10:15	GXF
cis-1,3-Dichloropropene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Dichlorobromomethane	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Ethylbenzene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Methylene Chloride	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Tetrachloroethene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Toluene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
trans-1,2-Dichloroethene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
trans-1,3-Dichloropropene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Trichloroethene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Trichlorofluoromethane	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Vinyl Chloride	<10	ug/l	10	EPA 624	03/09/11	10:15	GXF
1,3-Dichlorobenzene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
1,4-Dichlorobenzene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Total Xylene	<5	ug/l	5	EPA 624	03/09/11	10:15	GXF
Semi-Volatiles*	--				00/00/00		--
2,4,6-Trichlorophenol	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
2,4-Dichlorophenol	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
2,4-Dimethylphenol	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
2,4-Dinitrophenol	<50	ug/l	50	EPA 625	03/11/11	15:35	MEB
2-Chlorophenol	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
2-Nitrophenol	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
4,6-Dinitro-o-cresol	<50	ug/l	50	EPA 625	03/11/11	15:35	MEB
4-Chloro-3-methylphenol	<20	ug/l	20	EPA 625	03/11/11	15:35	MEB
4-Nitrophenol	<50	ug/l	50	EPA 625	03/11/11	15:35	MEB
Pentachlorophenol	<50	ug/l	50	EPA 625	03/11/11	15:35	MEB

Reviewed by:

Angie Woodward
A. Woodward/Technical Director

Report Date:

March 23, 2011

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460019

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ENVIRONMENTAL SYSTEMS SERVICE, LTD.

Page: 4

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WARRENTON, VA 22186

Job Location: PERMIT RENEWAL - ROUND 1

Collected by: ANDRIA SWANN

Date Received: 03/03/2011

ANALYSIS REPORT

Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
Diethyl Phthalate	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Dimethyl Phthalate	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Fluoranthrene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Fluorene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Hexachlorobenzene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Hexachlorobutadiene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Hexachlorocyclopentadiene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Hexachloroethane	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Indeno(1,2,3-cd)pyrene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Isophorone	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
N-nitrosodi-n-propylamine	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
N-nitrosodimethylamine	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
N-nitrosodiphenylamine	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Naphthalene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Nitrobenzene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Phenanthrene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Pyrene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Phenols, Total*	<0.02	mg/l	0.02	EPA 420.4	03/07/11	12:45	ARC

Reviewed by:

Angie Woodward
A. Woodward/Technical Director

Report Date: March 23, 2011

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* Subcontracted test



ENVIRONMENTAL SYSTEMS SERVICE, LTD.

Page: 3

Work Order #: 15484

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WARRENTON, TOWN OF
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Job Location: PERMIT RENEWAL - ROUND 1

Collected by: ANDRIA SWANN

Date Received: 03/03/2011

ANALYSIS REPORT

Description	Result	Unit	Rpt. Limit	Method	Anlys Date	Time	Init
Phenol	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
1,2,4-Trichlorobenzene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
1,2-Diphenylhydrazine	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
2,3,7,8-Tetrachlorodibenzodiox	SEE COMMENT	ug/l	40	EPA 625	03/11/11	15:35	MEB
2,4-Dinitrotoluene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
2,6-Dinitrotoluene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
2-Chloronaphthalene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
3,3-Dichlorobenzidine	<20	ug/l	20	EPA 625	03/11/11	15:35	MEB
3,4-Benzofluoranthene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
4-Bromophenyl phenyl ether	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
4-Chlorophenyl phenyl ether	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Acenaphthene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Acenaphthylene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Anthracene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Benzidine	<20	ug/l	20	EPA 625	03/11/11	15:35	MEB
Benzo(a)anthracene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Benzo(a)pyrene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Benzo(ghi)perylene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Benzo(k)fluoranthene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Bis(2-Chloroethoxy)methane	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Bis(2-Chloroethyl)ether	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Bis(2-Chloroisopropyl)ether	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Bis(2-Ethylhexyl)Phthalate	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Butylbenzyl Phthalate	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Chrysene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Di-n-butyl Phthalate	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Di-n-octyl Phthalate	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB
Dibenzo(a,h)anthracene	<10	ug/l	10	EPA 625	03/11/11	15:35	MEB

Reviewed by:

Angie Woodward
A. Woodward/Technical Director

Report Date: March 23, 2011

VA LAB ID# 460019

* Subcontracted test

4/20/2011 4:50:06 PM

Facility = Town of Warrenton Wastewater Treatment Plant

Chemical = Total Recoverable Lead

Chronic averaging period = 4

WLAa = 110

WLAc = 12

Q.L. = .5

samples/mo. = 1

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value =

Variance =

C.V. =

97th percentile daily values =

97th percentile 4 day average =

97th percentile 30 day average =

< Q.L. = 1

Model used =

No Limit is required for this material

The data are:

0.15

4/20/2011 4:40:18 PM

Facility = Town of Warrenton Wastewater Treatment Plant

Chemical = Total Recoverable Copper

Chronic averaging period = 4

WLAa = 12

WLAc = 8.3

Q.L. = .5

samples/mo. = 1

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = 3.85

Variance = 5.3361

C.V. = 0.6

97th percentile daily values = 9.36865

97th percentile 4 day average = 6.40559

97th percentile 30 day average = 4.64330

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

3.85

4/20/2011 4:43:31 PM

Facility = Town of Warrenton Wastewater Treatment Plant

Chemical = Total Recoverable Nickel

Chronic averaging period = 4

WLAa = 170

WLAc = 19

Q.L. = .5

samples/mo. = 1

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = 1.89

Variance = 1.28595

C.V. = 0.6

97th percentile daily values = 4.59915

97th percentile 4 day average = 3.14456

97th percentile 30 day average = 2.27944

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

1.89

4/20/2011 4:44:28 PM

Facility = Town of Warrenton Wastewater Treatment Plant

Chemical = Total Recoverable Zinc

Chronic averaging period = 4

WLAa = 110

WLAc = 110

Q.L. = 2.0

samples/mo. = 1

samples/wk. = 1

Summary of Statistics:

observations = 1

Expected Value = 31.5

Variance = 357.21

C.V. = 0.6

97th percentile daily values = 76.6526

97th percentile 4 day average = 52.4093

97th percentile 30 day average = 37.9906

< Q.L. = 0

Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

31.5